General

1873 - 1930

Other Indigenous People

6

C. Hart Merriam
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Says Races of Man Divided Early in Man's History

HUMAN beings became differentiated into races far back in man's history. It happened probably before the last Ice Age, and the cradle land of the races was Asia.

So anthropologists of the American Association for the Advancement of Science were told by Dr. Griffith Taylor of the University of Chicago.

He protested against the too-simple method of dividing men into three races, Caucasian, Mongol, and Negro, or, in effect, the white, yellow, and black. A more scientifically satisfactory classification is needed, he said, based on as many traits as possible, such as skin color, facial breadth, head index, hair, and stature.

Dr. Taylor has suggested a classification of five major races of man: Negro, Mediterranean, Alpine, Negrito, and Australoid. Mongolians he places as a variant of the Alpine race.

Negritoes, he believes, were the first to evolve as a distinct race, and from southern Asia they found their way to Africa. Africa would have been the easiest line of migration for them when they were thrust out of south central Asia by a menacing change in climate. And it was primarily climate change, such as increasing cold or dryness, which Dr. Taylor sees as the cause of man's ancient wanderings. Alpines were the last to be differentiated, and still occupy the cradle land in south central Asia.

Dr. Taylor finds that the view that Negroes and Australoids derive from Neandertal men is well supported.

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name or a noun, gives it a male character. In the theogony of the Mayas *Htubtun* seems to have occupied the same position as *Plutus* did in Greek and Roman mythology, for both were the dispensers of mineral riches, especially metal and precious stones. Whether *Htubtun* stood in similar relation to some other kindred deity as *Plutus* was to *Pluto*, the writer has not been able to learn, though the very design of the present specimen may justify such a supposition.

ANCIENT HISTORY OF NORTH AMERICA.

COMMUNICATION TO THE ANTHROPOLOGICAL SOCIETY OF VIENNA, BY DR. M. MUCH.

[Translated for the Smithsonian Institution by Professor C. F. Kroeh.]

The material for the ancient history of America is already so extensive, that I must content myself with a general sketch, briefly touching upon the different views on the origin of the aborigines and their place among the races.

At first it was thought they derived their origin from the Jews, and Englishmen and Americans versed in biblical lore drew largely on the Old Testament for proofs. Soon the Carthagenians and Phœnicians took the place of the Jews, to be displaced in their turn by the Egyptians or Macedonians as the progenitors of the Indians. Finally the blood of Celts and Teutons, and even of Greeks and Romans, was said to flow in their veins. The most plausible reasons were found for such views, from which scarcely a people of any note was excluded.

The report that Greek inscriptions and remains of Roman camps had been found in America, you will, of course, immediately reject as a silly hoax. More lately, extensive remains of Norman settlements were said to have been discovered in the United States, and these were immediately employed to make up a case, with the Norse myths and songs, which unfortunately existed only in the imagination of the discoverer.

Other American scientists, especially Morton, advocated an autochthonous race of America on the sounder basis of comprehensive anthropological studies. But this view is no longer satisfactory, for the impulse to the civilization of Mexico, Central America, and Peru, mysterious as it still is to-day, not only seems to have come from without, but the people themselves seem to have been foreign and not native to the soil. The opinion, advanced a long time ago, that the original inhabitants of America are of Mongolian extraction, is gaining more and more weight.*

According to Professor Haeckel's genealogy of the twelve races, the Mongolians separated early into three branches—a southeastern or Coreo-Japanese, a southwestern or Indo-Chinese, and a northern or Ural-Altaians. These again sent out branches westward, where they separated into Tungusians, Samoyedes, Kalmucks, Tartars, Turks,

* I find this view still further supported in the interesting lecture of Professor Fr. Müller on the inhabitants of Alaska, in which he points to the similarity of religious views in the northeastern tribes of Asia and the Indians of Alaska.

Fins, and Magyars. Another branch probably took an easterly direction long before giving rise to the "Arctics," who first peopled Northeastern Asia, and afterward crossed Behring's Straits, and passed into America.

Perhaps the depressing influences of thousands of years had formed a deteriorated branch in Asia, the descendants of which are still represented by the Esquimaux in the extreme north of America, while a southern and more vigorous branch chose the more temperate parts of North America, and spread in the course of time over the whole continent. In the extreme south this race was again modified by depressing natural influences similar to those which operated in the north.

The aborigines of America differ, as we all know, in their languages, and are divided into tribes; but the type of these tribes and the organic structure of their languages are essentially the same. Only the Esquimaux differ from the general type, but their language is intimately related to those of their southern neighbors. According to this view, the wave of Indian population, which in the old world advanced from east to west, must have taken a direction from north to south in the new; it is confirmed, indeed, by historical and mythical traditions, as well as by the character of the remnants of civilization found as we advance from north to south.

Greater or less portions of the population, especially in Mexico and Central America, seem, however, to have been in constant motion. This mobility is the attribute of a nation of hunters, who drive the existing population before them. Again, the migratory impulse, so to speak, seems to belong to a certain period in the development of a people. It is exemplified in our own Teutonic ancestors, whose impetuous advance not only caused the downfall of the Roman Empire of a thousand years' standing, but also involved the entire population of Europe in its motion.

Passing to the relics of American civilization, it must be stated in advance that the determination of their age, their order, and their whole history is as yet much more difficult than that of European remains. And this for two reasons: First, because of the very gradual development of civilization. The form and material of utensils and weapons remain the same during long intervals, and sometimes up to the historical period, whence it happens that remains, differing in age, perhaps, by thousands of years, can hardly be distinguished. Secondly, certain characteristic periods in the development of civilization, such as the appearance of metallic utensils in Europe, by which a classification might otherwise be effected, are wanting. Metals, especially copper, were long used in America; they are found in the most ancient deposits, while they are absent in the more recent; but the use of copper is no proof of a more advanced civilization in America, since it was for the most part employed in as rough a state as that of stone. Pieces of copper were broken off from the native blocks by means of

stone hatchets, and fashioned with the hammer. The natives evidently had no idea of its fusibility. For this reason, the use of the metal does not indicate greater progress, and we are thus deprived of a means of classification.

In Mexico, Central America, and Peru, it was different, however. There we have evidence of a high degree of skill in the working of metals (iron being almost the only exception) in the more recent period. They had advanced beyond the mere hammering of pieces of metal found by accident, and understood smelting, and even attempted to obtain metals by mining for ores. The American remains were, therefore, arranged according to the places where they were found, or the purposes for which they were intended. But to keep in view the progress of development, I have taken the liberty of adopting the following arrangement: I would assume a period immediately preceding the advent of the Europeans in America, and continuing for a short time after. This would correspond to our historical age, and may be designated, in a restricted sense, as the historic period.

A second epoch would include a time far removed even from the recollection of the inhabitants at the time of Columbus, and characterized by a different distribution of the population and other complete revolutions. To this period belong the great mounds, particularly those of the Ohio Valley. It might be called the mound period, and corresponds to the advanced portion of the age of stone, and the beginning of the age of bronze in Europe.

The third and most ancient period would then include those discoveries which point to the co-existence of man with extinct species of animals. It corresponds to the age of the mammoth and the reindeer in Europe, and might be called the diluvial period.

Utensils of all kinds, and buildings or mounds, belong to the two more recent periods. The buildings of the first or historic period are found chiefly in the eastern parts of the United States and Canada, in Mexico, and CentralAmerica. In the United States, Canada, and farther north, they consist of mounds and bulwarks.

The mounds of the first period are places of interment, and correspond precisely to the *tumuli* in Europe. They were probably used for the burial of chiefs, since they contain for the most part one or only a few skeletons. Sometimes, however, heaps of bodies or their skeletons are piled up, and covered with a knoll of earth. Whether these are the bodies of Indians fallen in battle, or of the victims of immense sacrifices, remains undecided. They are on an average 5 feet high, with a base 25 feet in circumference; but there are some as high as 15 feet, and having a circumference of 60 feet. That the Indians, even during the time of their first intercourse with the Europeans, erected such hillocks as graves for distinguished chiefs, or to commemorate important events, has been proved in several cases.

The works of defense consist of walls of earth, and rarely of stone,

furnished in each case with palisades. They are for the most part near rivers and brooks, always near water, and especially at places surrounded on more than one side by water, on elevated ground, defended on one or more sides by natural strength of position.

To the age which, in America, corresponds to our historical period, belong also the remnants of those grand structures, those wonderful ruins of palaces, temples, and cities, which, even at the present day, bear witness of the high degree of civilization of their builders in numerous localities of Mexico, Yucatan, and Central America. Although they are almost destroyed, and covered with luxurious vegetation, these remains afford a wealth of scientific material, but I must content myself with merely naming them.

The characteristic structures of the second period are the mounds, and the period itself is the period of the mound-builders. These mounds are of three kinds, for burial, sacrifice, and worship, and occur in the whole Mississippi Valley, but most frequently in the Ohio Valley, in the vicinity of Chillicothe. The burial-mounds correspond to those of the Atlantic States, but are generally larger. Many are as high as 60 feet. They indicate a greater antiquity, by the more advanced stage of decomposition of the contained skeletons. Sometimes the bodies were burned and their ashes deposited in urns. Weapons, ornaments, and utensils are always found in them, but remnants of food occur only in the more recent. Signs of fire and animal bones, probably remnants of sacrifices or of "wakes," are often found under the top surface of these mounds. Sometimes the chiefs of a later period were buried in the old mounds, and in such cases the well-preserved skeleton of the new-comer is found above the crumbling one of the older. An interesting case in point came to light in December, 1870, when a mound near Saint Louis, Missouri, was opened by a scientific commission. It was 40 feet high and 300 feet long. Twenty years ago a dwelling-house was built on it and a cemetery instituted beside it. On digging, the bones of three different races were successively brought to light; first, those of white men; in the center, those of Indians of the present day; and below, those of the ancient mound-builders, who lived there before the Indians that possessed the land at the time of the white man's arrival. Their bones were deposited in two large stone chambers.

The second class of the older earth-mounds consists of those used for sacrifice. They are only a foot or two high. A small depression at the top bears evidences of burnt sacrifice on the hardened clay; and the ashes often contain objects of various kinds placed there to propitiate their deity or to atone for their misdeeds. These objects are almost without exception broken, and have suffered from fire and the effects of time.

The third class is that of the temple or palace mounds, the most important of all. They have generally the shape of truncated four-sided pyramids, with terraces, steps, and dam-like elevations, which are often

interrupted by smaller mounds. Their dimensions are enormous. Some are as high as 90 feet, and have a length of from 500 to 700 feet at the base. The upper surface of the great pyramid in Washington County, Missouri, contains 12,000 square feet. It is the largest of a group of eleven of such mounds. These mounds are either found alone or in groups; some are surrounded by earth-walls and others are not. Besides those of the Mississippi Valley, similar large earth-pyramids are found in the Colorado Valley, where they are considered as Aztec structures. They have unmistakable signs of former buildings upon them. Probably these earth-works had no other object than to serve as elevated bases for temples and the houses of chiefs and priests. These buildings must have been formed of lighter material, for they have entirely disappeared. Nevertheless they remind us of similar but more perfectly executed buildings of a later time in Mexico and Central America. All investigators agree that their builders belonged to a much higher civilization than those of the smaller grave-mounds in the east, or the Indians of the present day. It is said that the utensils from these mounds are worked with much more skill, and that some among them justified the conclusion that the builders followed agricultural pursuits. Another remarkable circumstance is, that now and then copper utensils were found in the possession of the Indians on the Atlantic coast. These, however, can only have been such as they found among the remains of the more ancient race; since investigations of the Lake Superior copper region prove that the knowledge of making use of these copper-ore deposits had already been lost at the time when the Europeans took possession of America. Indeed, copper utensils are found only in the earth-works of the older, but not in the mounds of the more recent period.

The mere presence of these large earth-works, however, with their inclosures or bulwarks, is sufficient proof of a more highly developed people, who were no longer nomadic. I cannot help thinking that the Mississippi Valley may have been at one time the home of the Aztecs and Toltecs, who there erected, so to speak, the first crude models of their later wonderful structures, and then moved southward from unknown causes, carrying with them their higher civilization, and developing it still further in their new homes; while the inferior race, which took possession of their abandoned dwellings, remained without knowledge of the rich ore deposits.

There are also earth-works of another kind, similar to those in the Atlantic States, which doubtless served as fortifications. Some probably were inclosures of small villages; for they are usually found near single or around whole groups of mounds, and have the ditch on the inner side. They frequently inclose large areas, but not a trace is left of the dwellings, which may have been within.

A very peculiar species of earth-works are in the shape of men or various animals, the outlines of which they represent. Perhaps these partook of a religious or national character, some of the tribes being named after certain animals.

In the most recent period, there is an enormous difference in the nature of the utensils employed by the northern and southern peoples. This difference is due to the use of metals. In the north are found almost exclusively utensils of stone, while in the south very fine utensils of copper, bronze, gold, silver, &c., occur besides. If the report is true that arrow-heads of iron were found in possession of the inhabitants of some parts of South America, these can only have been made of meteoric iron.

The utensils occur in the same manner as in Europe. They are found in the tomb-mounds, where they were deposited with the dead; or in the altar-mounds, where they were brought as a sacrifice, or rather a gift of propitiation to their deity. In the latter case they are usually broken to pieces, probably on purpose, injured by fire, and mixed with the ashes of the victims. They are frequently brought to light by the plow or by violent rains, which wash away the soil, and lay bare the heavier stone utensils. The distribution of settlements is also similar; often considerable regions are without any, while they are very numerous in more favorable localities. In North America, they are most frequent in valleys, where they are recognized by an abundance of fragments of vessels on the surface of the soil.

Sometimes earth-heaps similar to the Danish Kjökkenmöddings indicate the spots where those old settlements stood. They have been lately investigated in several cases by Wyman, Morse, and our indefatigable countryman, Charles Rau. Their appearance is the same as in Europe, with the difference, of course, that the animal remains belong to different species. Among the masses of broken shells, they contain more or less numerous utensils of stone and bone along with potsherds. They occur along the whole Atlantic coast. Near Keyport, New Jersey, on an island north of Du Français Inlet, at Crouch's Cove, Goose Island, in Casco Bay, Eagle Hill, at Ipswich, Massachusetts, Long Island, and the mouth of the Altamaha River, in Georgia. Traces are also found along the coasts of Massachusetts, Newfoundland, Nova Scotia, Florida, and California. A portion of the city of New York is said to be built upon such deposits. To what period they belong, or whether they belong to different periods, has not yet been determined. Finally, we must mention the relics of human civilization found by the German North Pole Expedition in Greenland, and brought home by it from the abandoned huts of the Esquimaux. They probably belong to a comparatively recent time.

The tools, weapons, vessels, and ornaments of the inhabitants of America probably remained unchanged for very long periods of time. Only the Mexicans made considerable progress in the latest period; but we know that even they had not yet given up their knives of obsidian, although they might have made them of bronze. Montezuma himself wielded the terrible Mexican sword, the edge of which was composed of pieces of obsidian, and you can even to-day admire his stone battle-ax in the Ambras collection.

The objects found in the North are chiefly arrow-heads, as might be expected in the case of a people of hunters and warriors. In the collection before you, there are specimens of the various shapes, some scarcely an inch long and having a rounded point, while others are more than three inches in length. Precisely similar in shape and material, (the latter being pure quartz, flint, chalcedony, jasper, rock-crystal,) only larger, are the lance-heads. The royal mineralogical cabinet is in possession of a magnificent arrow-head of pure rock-crystal, evidently of American origin. It is remarkable that many lance and arrow heads slant unequally on the two edges, so that the arrow or lance would assume a rotary motion on being discharged.

The knives were also made of flint and obsidian by breaking them off from suitable blocks by means of a single blow. They differ in no way from the European. The Indian wedges are also like those found in Europe, a circumstance that need not surprise us in an instrument of so primitive a nature. The specimen before you, with its rounded sides, was taken directly in the hand, and used to skin larger animals.

The hatchets, of which three specimens are before you, are of a shape peculiar to America. They are provided with a deep groove under the neck running around the sides, into which was fitted a forked branch forming the handle. From their frequent occurrence we conclude that they were the most usual weapon, which was later and only gradually supplanted by the iron tomahawk. Hammers with holes to receive the handle are rare.

Among the other stone instruments, the grindstones differ also from the European, being of the shape of stones used for rubbing up colors. Larger disks, concave on both sides, were probably used in games, and smaller ones of various shapes, and pierced with holes, may have served as ornaments. The oval stone before you, with a groove running all around it, may either have been a piece of ornament, or a sinker for a net.

Which shapes and which material belong to the earlier, and which to the later times, will probably be determined only after long researches. Dr. Dickerson, of Philadelphia, claims an age of three thousand five hundred years for these arrow-heads, which were found in one of the Mississippi States. Among them you perceive half-finished and spoiled pieces. Those made of quartz correspond in shape with the iron arrows of the present day, of which you also have a specimen before you; they are, therefore, very likely the more recent. Among the metallic utensils, we must first mention the copper hatchet, an imitation of the stone wedge attached to a club like the Celtic ax, a chisel, and lance-heads. Among the ornaments are perforated copper plates, concave disks, objects resembling buttons, small round disks of thin copper plate, or wire for stringing on a thread, like pearls. The copper was doubtless taken to Central America from the Lake Superior copper region.

The inhabitants of Mexico and Central America had made great prog-

ress in the working of gold, silver, copper, and tin. They made not only weapons and ornaments of metal, but also vessels showing a high degree of skill. They alloyed copper and tin, and manufactured bronzed utensils, to which they imparted considerable hardness by hammering. But the arrow-heads and knives of obsidian remained in use at the same time; the latter probably in consequence of their being used, in the terrible human sacrifices, to open the breast of the victim and cut out the heart. Immense numbers of such obsidian knives, as well as arrow-heads and chips, are still found in various localities. A mountain distinguished for the large number of these objects is still called "the mountain of knives." The inhabitants of the Mississippi Valley obtained the obsidian arrow-heads from Mexico in exchange for other articles.

The pipes are peculiar to America. They are called mound-pipes, on account of their being found almost exclusively in the altar-mounds. The Indians were in all probability the first smokers, and so great was the esteem in which they held the enjoyment derived from it that they devoted more labor and skill upon their pipes than upon their weapons. The pipes are of stone, with a base in some cases 5 inches long, one end of which forms the stem. The bowls are in the center of the base and are about 1 or 1½ inches high. These bowls are in most cases fashioned in imitation of human heads, with all the characteristics of the Indian race upon them, or various animals, which are so faithful that they can be recognized at once; a fact which is the more surprising, since the pipes are fashioned of a single piece of very hard stone. The pipes of baked clay found in New York and elsewhere seem to belong to a later period.

The Indians of to-day also devote considerable attention to the adornment of their pipes. Many are cut from the red pipe-clay of the West, which was discovered by the celebrated artist and ethnographer Catlin. The beds of this clay were considered as on neutral ground by the Indians.

Among the other objects, which I have only time to name, are needles and bodkins of bone and horn, pearls of bone and of various shells, genuine pearls, perforated claws of eagles and bears, teeth of wild-cats and of the shark, perforated bits of mica, and the like. The vessels of clay, however, require a more detailed consideration. They also show some resemblance to the products of the corresponding era in Europe. They were all fashioned without the potter's wheel; in many cases baskets of willow or rushes served as models. They were covered inside with clay and placed with it in the fire. Thus the wicker-work left its impression on the outside of these vessels. This method, according to Catlin, was still practiced in the present century. In some southern localities pumpkins were covered with clay on the outside, and the whole placed in the fire.

A great number of the vessels, like the older European ones, had a round bottom, and could only be used for hanging up by means of a

projecting edge. Their forms are as various as their dimensions. The material consists of a black clay, mixed, as in Europe, with quartz sand, or, as is the case more frequently, with more or less finely pulverized shells. Sometimes the clay is used without any admixture. In the West Indies the pulverized bark of two trees, Hirtella silicea and Hoquilca, is used in the place of sand. This bark is very rich in silica, and produces vessels of a very fine grain, fragments of which are found in large numbers in all settlements, and especially at the places of manufacture. One of the latter was discovered and described some years ago by Charles Rau.

That the Mexican porcelain vessels should show a higher order of skill, might be expected after what has been said. A Portugese writer, during the first years of the Spanish rule, declared that they were in no way inferior to those of Europe.

Although it is not denied that there is no reason for distinguishing in America between a palaeolithic and a neolithic period, there are, nevertheless, authenticated facts which might lead to such a distinction. One of these is the discovery of human bones together with those of extinct species of animals near Natchez, Mississippi. Another is the discovery of a human skeleton under several layers of submerged forest formation in the Mississippi delta, near New Orleans. Still another is the presence of human bones, in a limestone conglomerate forming a part of the coral reefs of Florida, whose age is estimated at ten thousand years by Agassiz.

Unfortunately there has been no such exaggeration in America, along with trustworthy reports, that caution is necessary in accepting as true unusual statements, even when they have a scientific coloring.

From the report of the German archaeologist, Dr. Koch, on the mastodon[1] found in

[1] I must state, however, that Lyell assigns much less antiquity to the American than to the European mastodon.

Gasconade County, Missouri, it is beyond doubt that man existed in America as early as that animal. In another case flint arrow-heads were found along with bones of the mastodon in an undisturbed deposit; and at the Pomme de Terre River, Missouri, a mastodon skeleton, together with an arrow-point, as found covered with 15 feet of alluvium.

Finally, I must state that there is scarcely a subject which excites the interest of American scientific men so much as the ancient history of their continent. Let me call your attention to the liberal support which they enjoy, the existing collections in every large city of America, the efforts of the Smithsonian Institution, and the donation of the great philanthropist, Peabody, who appropriated £100,000 sterling to the establishment of a museum of Indian antiquities.

The greatest collection of American antiquities in Europe is that at Salisbury, England; and in America that of the Smithsonian Institution. Dr. Dickerson has also a very large collection of which he is about to publish a catalogue.

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Science - Oct. 9, 1936.

DISCUSSION

NEW RACIAL BLOOD GROUP STUDIES IN EUROPE AND EGYPT

DURING the year 1935–1936, the authors carried out studies on the frequencies of the Landsteiner blood groups and the newer M and N groups of Landsteiner and Levine. The opportunity was taken to observe also the frequency of certain other hereditary factors, such as the ability to taste phenyl-thio-carbamide.[1] Work was carried out in Cairo, Kharkov, Tiflis, Zagorsk (near Moscow), 5 Welsh towns (Llangefni, Caernarvon, Bangor, Machynlleth, Tregaron), Dublin, San Sebastián and Assiut. So far as the authors are aware, no work on the Landsteiner groups has been published from any of these places except the first three, data on M and N have appeared only from the first and data on "taste blindness" only from the last. The most interesting results obtained would seem to be the following.

Two places were found where the percentage of N is significantly lower than the rather consistent figures thus far obtained for Europe (Zagorsk and Tiflis). It will be recalled that the only previous instance of this was furnished by the North American Indians.[2]

Contrary to what might have been expected, no significant difference in blood group frequencies was found between the Copts and Mohammedans in Egypt. In Assiut, the percentage of B was definitely higher than in Cairo (30.5 *vs.* 25.3).

The blood group formula of the Basques (San Sebastián), apparently similar to that of the Australian aborigines and certain American Indians, is probably 0 = ca. 60 per cent., A = ca. 40 per cent. (actually found: Basques—0 = 56.0, A = 40.5, B, 1.3, AB, 2.2; non-Basques—0, 45.9, A, 46.5, B, 5.0, AB, 2.6. The small amount of B found might be readily ascribed to mixture with non-Basques.

A rather low percentage of "tasters" was observed in Wales (for men, 46.7). Confirming the observations of Fisher and Brandt,[3] a sex difference, in most cases definitely significant statistically, was observed in the tasting results. The ratio of the percentage of female to the percentage of male tasters varied from 1.56 to 1.02.

In addition data were collected on about 200 sibs, which will be analyzed for evidence of linkage,[4] and more than 100 specimens of mummy tissue were obtained, in order to study, if possible, the blood groups of the ancient Egyptians.[5]

Details will be published elsewhere.

WILLIAM C. BOYD,
John Simon Guggenheim Memorial fellow, 1935–36
LYLE G. BOYD

[1] L. W. Parr, *Jour. Hered.*, 25: 187, 1934.

[2] A. S. Wiener, "Blood Groups and Blood Transfusions," pp. 132 and 169. Springfield: Charles C Thomas, 1935.

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METHODS OF RACIAL ANALYSIS[1]

SIGNIFICANCE OF THE TERM "RACE"

THE term "race" as applied to man is commonly employed with no accurate and well-defined meaning. One often sees references to the "white race," the "Jewish race," the "Latin race," the "Irish race." Such indiscriminate use of the word "race" implies a confusion of criteria. To speak of the "white" race is to assume that race is a matter of skin pigmentation; to refer to the "Jewish race" is to differentiate race on a basis of religion; a "Latin race" implies a linguistic criterion, and finally any reference to an "Irish race" must mean a race characterized either by geographical position or, failing that, by temperament. Such confusions of usage are usually confined to the non-anthropological writing public. All anthropologists agree that the criteria of race are physical characters. The tests of racial distinction are the morphological and metrical variations of such bodily characters as hair, skin, nose, eyes, stature—differences in shape and proportions of the head, the trunk and the limbs.

Although there exists among anthropologists this general agreement as to the physical basis of race, there is no such unanimity of opinion with respect to the further implications of a classification of mankind on the score of bodily attributes.

One school of anthropologists is disposed to deny that there are any cultural or psychological correlates of race. For these the somatological variations whereby race is determined are of little significance, except as convenient characters for classificatory purposes. They regard them principally and ultimately as effects of environment, though perhaps immediately heritable. Pigmentation may be dismissed by such as a result of climate, stature as a consequence of nutrition, head-form as a manifestation of individual variation or a by-product of separately inherited size-factors. Logically, such anthropologists refuse to recognize that language, material culture, mental capacity or social organization stand in any biological, mathematical or rational relationship to races as determined by these plastic and transitory physical characters. For them race is a congeries of environmentally determined bodily features, significant principally because it effects differences in outward appearance which arouse the prejudice of the ignorant.

[1] Address of the vice-president and chairman for Section H, American Association for the Advancement of Science, Kansas City, Missouri, December, 1925.

A second group of anthropologists, or more properly biometricians, devotes itself principally to the statistical analysis of anthropometric measurements and to the determination of the relationship of such measurements to each other and to various environmental conditions. Under the brilliant leadership of Professor Karl Pearson, these biometricians have developed precise statistical tools, whereby errors incident to the sampling process may be taken into account, variabilities may be reckoned and the relation of variables to each other may be measured by coefficients. These biometrical anthropologists recognize the physical basis of race, but they have not, for the most part, attempted to isolate racial types in the populations which they study. While admitting, doubtless, the racially mixed character of such people as the English they tend to deal with them as if they were racially homogeneous. The late Charles Goring, for example, in his magnificent study of the English criminal divided his large series of convicts into groups classified according to type of offence, and investigated almost every conceivable relationship between their physical characteristics, their mental qualities, their environmental surroundings and the nature of their delinquency. He neglected utterly, however, to distinguish between the various racial types which may have been represented in his sample and attributed such physical differences as he discovered to the influence of social class. In this he exemplified the tendency of the biometric school to study populations as a whole or by selected classes without attempting to distinguish between the various racial types included in them.

A third group of writers on racial subjects, usually not professional anthropologists, associates cultural and psychological characteristics with physical types on wholly insufficient evidence. These race propagandists commonly attribute to the physical subdivision of mankind to which they imagine that they themselves belong all or most of the superior qualities of mankind, physical, mental and moral. They talk of the psychological characteristics of this or that race as if they were objective tangible properties, scientifically demonstrated. Starting from an *a priori* assumption that physical types have psychological correlates, they attempt to refer every manifestation of the psychological qualities assumed to be the exclusive property of this or that race to the physical type in question. Great men of whatever period are claimed to be members of the favored race on the basis of their achievements and sometimes with a total disregard of physical criteria. In no case has any serious effort been made by such ethnomaniacs to isolate a pure racial type and to study either its mental qualities or its material culture. The fact that most if not all peoples are racially mixed is consistently ignored. While some of the conclusions of such writers may be correct, none of them have been scientifically established.

Definitions of "Race"

In the existing confusion as to the connotation of race, it is clear that the term requires exact definition, if any progress is to be made in studies which relate to race analysis or racial problems. I offer the following definition, not with the hope or expectation that it will be generally accepted, but merely in order to elucidate my own position.

A race is a great division of mankind, the members of which, though individually varying, are characterized as a group by a certain combination of morphological and metrical features, principally non-adaptive, which have been derived from their common descent.

A primary race is one which has been modified only by the operation of evolutionary factors, including the selection of its own intrinsic variations and of the modifications, adaptive or non-adaptive, possibly caused by environmental stimuli.

A secondary or composite race is one in which a characteristic and stabilized combination of morphological and metrical features has been effected by a long-continued intermixture of two or more primary races within an area of relative isolation.

Assuming, for the moment, the validity of the foregoing definitions, it is apparent that the present population of the world consists for the most part of secondary races and that primary races are represented only by inbred peoples within areas where little race contact is known to have taken place. Of such inbred peoples only a small fraction represent primary racial types either because they are absolutely unmixed or because pure racial types have been segregated out in relatively few individuals. For man has been a migratory animal from proto-human times down to the present and the contact of races has always resulted in race mixture.

I do not propose to enter into any elaborate discussion as to the specific unity or diversity of existing types of man. Certainly if fertility in interbreeding is regarded as the test of species all present varieties of man must be assigned to one group.

Criteria of Race

The criteria by which race classifications are established are admittedly physical. Furthermore, they are necessarily multiple. No single bodily character exhibits a sufficient range of variation to enable us to assign to each of the great human groups which require racial classification a distinct and exclusive development of that feature. There are not enough variations of any one feature to go around, unless we confine ourselves to two or three primary and well-nigh hypothetical races. A man's head must be broad in proportion to its length, narrow in proportion to its length or of medium breadth; his hair must be straight, wavy or curly. But there are more distinct types of men than distinct categories of hair-form or cephalic index, and one extreme variant of a bodily feature is not always associated with the same modification of another feature in individuals or in groups. Separate bodily characters in their various grades of development are not necessarily correlated with each other. It follows that racial classifications must be made upon the basis of a sum total of significant morphological and metrical features according to the measured and observed combinations of distinct variations of such features in large human groups.

If race implies the common possession of certain variations as a result of the same ancestry, significant racial criteria should be based principally upon non-adaptive bodily characters. No bodily characters are absolutely unmodifiable, but certain organs are more or less stabilized in their functions, and the less important these functions are, the greater is the probability of hereditary variations manifesting themselves unimpeded and unmodified in such organs. Heredity runs riot in indifferent variations and atrophied organs. The very insignificance of certain features, such as the form of the hair or the thickness of the lips, insures their hereditary transmission in the absence of selected adaptive modifications that have survival value. The human foot, on the contrary, is rigorously adapted and modified for support and locomotion in all varieties of man, and the practically identical requirements of a functional nature tend to obscure and obliterate any racial variations which may have existed or to subordinate them to such variations as may be consequent upon the habits of going barefoot or shod.

I regard the following bodily characters as mainly non-adaptive variations: the form, color and quantity of the hair, and its distribution in tracts; the color of the eyes and the form of the eyelid skin-folds; the form of the nasal cartilages; the form of the lips and of the external ear, the prominence of the chin; the breadth of the head relative to its length; the length of the face; the sutural patterns, the presence or absence of a postglenoid tubercle and a pharyngeal fossa or tubercle, prognathism, the form of the incisor teeth; the form of the vertebral border of the scapula, the presence or absence of a supracondyloid process or foramen of the humerus, the length of the forearm relative to the arm; the degree of bowing of the radius and ulna; the length of the leg relative to the thigh. This list is not, of course, exhaustive. Many of the features enumerated above, and perhaps all of them, may be functionally modified, if the need for such modification arises. For example, the breadth of certain Eskimo skulls appears to have been constricted by the hypertrophy of the temporal muscles. Usually, these characters, however, show no apparent relationship to function, and seem to maintain themselves by the inertia of heredity, occurring sometimes as individual or family variations, and sometimes more widely distributed in racial stocks.

Another group of bodily characters include those the distinctive variations of which may have originated in functional modifications, but which have become so stabilized as to persist in certain stocks even in contravention of their original function. These may also be utilized as racial criteria, subject to a precaution, *viz.*, that they may be remodified in an opposite direction. Among these are pigmentation of the skin, breadth of the face, height and breadth of the nose, size and prominence of the malars, shape and proportions of the hard palate, height of the head, volume of the brain, proportions of the thorax, relative length of the lower extremities, relative length and angle of inclination of the heel-bone and size and development of the calf muscles.

Features that seem easily modifiable in the individual and in the group through the action of environmental factors, and especially by quality of nutrition, diet, gait and exercise, can not be trusted as criteria of race, except in the absence of evidence for the operation of such environmental causes. These include stature, weight, length of the upper extremity, proportions of the hand, most variations of the bones of arm, degree of lumbar curvature and pelvic inclination, most of the variations in the long bones of the lower extremity, including femoral torsion, bowing, pilaster, platymeria, variations of the articular surfaces of the tibia and of the shape of the tibial shaft.

The Application of Racial Criteria

In the actual practice of racial analysis a number of questions arise as to the relative importance of various criteria and the method of procedure in the application of the different tests. What differences in methods of analysis are involved in the study of living peoples as contrasted with the investigation of skeletal remains? Should stress be laid upon morphological or metrical observations or a combination of both? Is the diagnosis to be made upon the basis of individual combinations or group means? How may we isolate pure racial types?

Let us consider first the application of racial test to living peoples in comparison with the study of

skeletons. Certain obvious advantages obtain in the investigation of the living. The material is more abundant, there is no doubt as to sex identification and comparatively little doubt as to age; data with respect to individual and family history and ethnic affinities are ascertainable, as well as the environmental backgrounds of the people under investigation. Many significant features lacking in skeletal material such as the form of the soft parts of the eyes, nose and mouth, the form and distribution of hair and the pigmentation of the body may be examined.

On the other hand, there are certain disadvantages involved in the study of the living. The personal reactions of the subjects must be considered and opportunities for assembling and subdividing the grouped material are lacking. Each individual can as a rule be observed and measured only once. Measurements on the soft parts are far less accurate than measurements on the skeleton, and most significant skeletal features can not be observed or measured on the living. Certain striking and obvious characters of living subjects are likely to mislead the investigator in his racial analysis. The form and color of the hair is often radically altered by artificial means. Phenomena of dominance tend to obscure relationships in composite races, particularly in pigmentation and the form of the hair and soft parts. A wash of yellow-brown pigment and the dominance of straight, coarse, black hair has, in my opinion, for instance, created a mistaken impression of the physical homogeneity of the American Indian.

The advantages and disadvantages of analyzing racial elements in skeletal material are naturally the opposite of those that obtain in the case of living material. Our present imperfect knowledge of the correlation of variations of the soft parts with those of the bony skeleton renders uncertain many racial determinations upon bones, but studies on the living are subject to the same disadvantage. But in the investigation of early and extinct types of man and of past populations our dependence is naturally upon skeletal material. I am of the opinion that racial characteristics are better defined in the skeleton than in the soft parts. This seems to be the case particularly in the skull. Many individuals of mixed blood, who are fundamentally white, show characters of skin, pigmentation and soft parts which would lead a superficial observer to classify them as predominantly negroid. But the skull and framework of the body may show a basically non-negroid morphology. On the other hand, it is equally true that some persons who appear to be white show definite negroid or mongoloid skeletal features. An ideal method of racial investigation would be to follow the study of the soft parts with the examination of the skeleton in each case, but so far as I know this method is pursued only by Professor Wingate Todd at Western Reserve University, and racial studies are naturally confined to such types as happen to pass through the dissecting room. Correlations of features of the soft parts with skeletal structure may sometimes be obtained in the living by the use of the X-ray, but this method is usually impracticable.

The comparative importance of morphological and metrical observations for purposes of racial diagnosis has not been clearly established. Every student of the subject knows that many of the significant characters of the skeleton and the soft parts are non-measurable. They are, however, capable of classification according to presence or absence, grade of development and form, if the observer is experienced and is able to maintain a consistent standard for his morphological appraisals. These qualitative observations have usually been neglected by students of race because of the difficulty of recording them and of dealing with them statistically. Now, however, thanks to the work of the biometricians, methods have been developed whereby such qualitative observations may be treated mathematically. The method of mean square contingency enables one to express by a coefficient the interrelationships of different non-measurable features within a series, and it is also possible to ascertain the correlation between measured and observed characters. There is now no excuse for neglecting morphological observations.

Measurements have always been favored in the investigation of racial groups, because of their precision and because of the ease with which they may be handled mathematically. But crude dimensions are not often racially significant in the individual, and their value for this purpose is somewhat questionable even when the means of groups and the variabilities are calculated. For this reason it has long been customary for anthropologists to calculate indices which express the relation of one dimension to another as a percentage. These indices are conventionally and somewhat arbitrarily divided each into three or more categories, according as the ratio of one dimension to another is small, medium or large. How far these index divisions correspond with racial variations is a moot question. Certainly it is dangerous to invest these artificial gradations of ratios with the official status of race determiners, without due investigation of their individual and intra-racial ranges of variation. Further, indices seem not to be inherited *in toto*, but the measurements of which indices express ratios may be inherited from the same or different parents, and more than one factor may be involved in a single measurement, not to speak of the individual variations which may crop out. In spite of these difficulties indices are a convenient and valuable means of expressing group and individual characteristics and should by no means be banished from the assemblage of racial criteria.

Rather more important than the problem of the comparative validity of morphological observations, measurements and indices is the way in which these are utilized. Should the racial analysis be based upon the combinations of metrical and morphological features in each individual included in the group or, on the other hand, upon group means of the various racial characters? Over-emphasis upon combinations of measurements, indices or morphological features in the individual is almost certain to result in the distinguishing of manifold physical types, many of which have no racial significance but are simply manifestations of individual or sex variations. On the other hand, combinations of group means may not represent any individual physical type whatsoever, but merely averages of independently variable characters. It seems to me that the solution of this difficulty lies in a proper realization of the significance of race. Races are great groups and any analysis of racial elements must be primarily an analysis of groups, not of separate individuals. One must conceive of race not as the combination of features which gives to each person his individual appearance, but rather as a vague physical background, usually more or less obscured or overlaid by individual variations in single subjects, and realized best in a composite picture. Nevertheless, if a group is racially comparatively homogeneous, a certain number of individuals will approximate very closely to the appearance of the composite. And the individual who departs farthest from the racial composite is likely to be the one who has the largest admixture of another strain. So it is probable that taking a sufficiently large sample of a relatively unmixed group one will find that the modal type tends to show a combination of approximations to the group means of the various characters. I am therefore of the opinion that the best method of testing the physical homogeneity of a group is to calculate the means and variabilities of separate characters and then to ascertain whether or not the individual types of most frequent occurrence manifest these average values of the separate characters in combinations.

A Method of analyzing Race

A considerable experience in the study of skeletal material and especially of skulls has resulted in the working out of the following method of racial analysis which utilizes both morphological and metrical observations. On each skeleton the usual measurements are taken and the conventional indices are calculated. Morphological observations, carefully graded, relating to every significant non-measurable character, are recorded on appropriate blanks. After measurements and observations are concluded each skull is assigned to a racial type or to some distinctively designated type, according to the anatomical judgment of the observer. Thus a skull may be called "Negroid," "Nordic," "Alpine-Mediterranean," etc., or it may be called some name indicative of a local type, such as "Guanche," "Basket-Maker," etc.

The next step is the statistical reduction of the measurements and indices for the group as a whole, the two sexes, of course, being separated. This involves the calculation of means, standard deviations, coefficients of variation and their probable errors. Percentage distributions of the index subdivisions are also reckoned. The graded morphological observations are likewise analyzed for the whole group, the percentages of each grade of every character being tabulated for each sex separately. We now have determined the general anthropometric and morphological features of the group as a whole, although the qualitative and quantitative data are as yet unrelated.

There follows the comparison of our group as a whole with other entire groups for which comparative data are available, which are possibly related and of which the racial composition may be more or less accurately known. The comparison is effected by taking the differences of the means of the two groups in the case of every measurement and every index. If the difference between the means of the two groups with respect to a given measurement or index is less than three times the probable error of such a difference, the two groups can not be said to differ significantly with respect to the mean of that measurement or index. Coincidences in the means of two or three measurements or indices are not necessarily indicative of relationship, but if a large number of measurements and indices in the two groups show insignificant differences the odds in favor of the two populations being of similar racial composition are greatly increased. When a substantial majority of means of measurements and indices in two series coincide or differ from each other only slightly, we are justified in concluding that similar racial elements have entered into the composition of the two groups, and if we know what the racial elements are in one of the groups we may infer that these are present in the other also. By comparing a number of groups with the one under investigation, one soon finds out the closest affinity of the latter.

The next process is the division of skeletal series into types, with the object of ascertaining the racial affinities of these types. Such classifications according to type may be attempted by several different methods. One is by individual combinations of index

subdivisions, as, for example, dolichocephalic- hyspicephalic- akrocephalic- leptoprosocopic, etc. The principal difficulty involved in such a method of index combinations is that the number of individual types is practically limited only by the number of indices utilized in the combinations. For example, if one utilizes four indices, each of which has three subdivisions, the number of combinations possible is eighty-one. In a series of 245 Tenerife male crania thirty-four of eighty-one such possible combinations occurred in individual crania. If n be the number of indices utilized, each of which has three subdivisions, the number of combinations possible is 3^n. If any considerable number of indices is utilized the individual type combinations soon exceed the number of individual crania in the series. Exactly the same difficulty is encountered if one attempts individual combinations of graded morphological features. Utilizing twenty-two morphological features, each having five gradations, I found that no two individual skull curves in a series of 247 Tenerife male crania were alike. It is apparent that such methods do not delimit racial types. Rather they test the number of individual variations of the series, and in racially heterogeneous groups these seem to be limited only by the mathematical combinations of gradations and the number of criteria employed.

I have found what I believe to be a solution of this difficulty. In the routine measurement and morphological examination of individual crania, each one is assigned to a designated morphological type according to the anatomical judgment of the observer. I think that this method of distinguishing racial types on the basis of morphological judgment is the most natural and practical procedure. It would be very difficult for the most skilled anthropologist to decide that a man is a Polynesian from an array of his measurements and indices, whereas the same anthropologist would unfailingly classify the subject as Polynesian after a few moments of careful observation.

When the group has been divided into morphological types by this method the next step is to test the metric and morphological validity of these types. The means of measurements and indices of each type must be compared with the corresponding means of the entire group. The significance of differences in means between the subgroups and the whole series must be appraised in relation to their probable errors. If the morphological types distinguished show significant differences in means of a majority of measurements and indices from the averages of the entire group, it may be inferred that the subgroups represent metrical types. Ordinarily in such cases the standard deviations and the coefficients of variations of the subgroups will be less than those of the entire series. The relationship of these observed types to graded morphological features, individually observed, may be established by making contingency tables and calculating coefficients of mean square contingency. If the observed types are morphologically valid certain significant associations between gradations of morphological features and type classification will be manifest. By the same contingency method it is often possible to establish relationships between the morphological types and combinations of index subdivisions in individual crania. In short, the division upon the basis of morphological type seems to establish subgroups which are metrically, indicially and morphologically relatively homogeneous.

When the subgroups of both sexes have been established according to types and tested for metric and morphological validity, the distinguishing features of the types are very apparent. The series will now consist of several type subgroups, some of which appear to resemble known racial types and others of which may seem to be the result of local combinations. It is now necessary to take the type groups singly and compare them with the most authentic and least mixed series of crania available belonging to the races which the respective types are supposed to resemble. For example, if we have distinguished a "Nordic" type, this type should be compared with series of crania from the German Grave-rows. If on the basis of a comparison of means and probable errors it is found that our "type Nordics" show insignificant differences from the means of the authentic Nordics in the substantial majority of characters investigated, or if the "type Nordics" differ less from any of the authentic series of Nordics than these authentic series differ from each other, it may be concluded that the designation of the subgroup type under investigation as "Nordic" is correct. When the affinities of the supposed racial subtypes have been ascertained in this way, the final step in analysis is to examine the mixed types which are presumably due to the crossings of the pure types, and to try to find out what morphological and metrical features have been inherited from the several racial elements.

Whether or not such a method of analysis enables one to isolate pure racial type naturally depends upon the presence or absence of pure types in the population examined and the availability of pure racial groups for comparative purposes. After securing types which seem to predominate of one racial strain it is theoretically possible to select from them the individuals who bear the closest resemblance to the composite racial picture. Or one may attempt to distil the quintessence of the racial type by selecting individuals on the basis of combinations of the non-adaptive features in the gradations of development most typical for the race.

The method described above has been developed in the study of skeletal material, and, in particular, of crania.[2] I see no reason why it can not be applied equally well to the analysis of data gathered upon living subjects. It is a laborious method involving a large amount of calculation, but necessitating no extensive knowledge of higher mathematics. I have little faith in short-cut methods and no use whatever for personal impressions unsubstantiated by metrical and morphological data properly reduced. If physical anthropologists wish to achieve scientifically valid results they must not content themselves with the presentation of tables of raw measurements, supplemented by their personal reactions by way of interpretation.

If races differ quantitatively in intelligence and qualitatively in psychological characteristics, such differences can be established only by the segregation of pure racial types and the subsequent investigation of their psychological attributes.

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POPULAR ASTRONOMIC EDUCATION IN EUROPE[1]

It was my privilege to visit astronomical observatories from the University of Upsala in northern Europe to the Vatican in the south, thus establishing contacts with the directors and other astronomers, and conferring with them about our project at the American Museum. All the astronomers that I visited showed a real interest in our proposed astronomical hall, and some contributed practical suggestions of value.

Observations

The director of the Vatican Observatory, Father J. G. Hagen, who by the way is a naturalized American citizen, strongly recommended the installation of a small telescope which could be used by visitors for viewing objects in the sky. This would not be for professional astronomical work, however, as our institution should not be an observatory, but rather a museum of astronomy. The objective lens of this telescope need not be larger than five or six inches in diameter. This advice of Director Hagen is strengthened by the popularity of the so-called *Uranias* of Europe. I am convinced that this is an excellent proposal and hope that place can be found for a small dome in which may be installed such a telescope.

Professor Elis Strömgren, director of the Astronomical Observatory at Copenhagen, had visited the Zeiss Projection Planetarium in Munich and was tremendously impressed with it, and several astronomers advised me to visit the *Urania* in Berlin, as well as the one in Vienna and the one in Zürich. These *Uranias* are popular observatories in which the people may, for a small fee, observe on any clear night celestial objects through a fair-sized telescope. These observations are aided and directed by a trained person who explains what is seen. When the sky is clear enough for observation, a red light is shown on the *Urania* building. Usually two lectures with observations are given, one rather early in the evening (eight to nine o'clock) and one rather late (ten-thirty to eleven-thirty o'clock). There was a large sign at the door of the Vienna *Urania*, stating that if the sky was clear on that night the following objects could be satisfactorily seen: Jupiter, Uranus, the star-clusters in Perseus and the great nebula in Andromeda. The *Uranias* are also open during certain hours of the day for the observation of sunspots with the astronomical telescope and for the viewing of mountains and other distant objects with a terrestrial telescope. How well established these *Uranias* are in Europe is indicated by this significant fact that both in Vienna and in Zürich the street passing the *Urania* is called *Uraniastrasse*.

The Astrophysical Observatory at Potsdam is one of the best constructed, one of the most complete and one of the most modern of those visited in Europe. Here, among other things, I examined their new Einstein Tower, which they believe to be an improvement on the one at our Mt. Wilson Observatory. With this equipment they will test the Einstein theory by measuring the displacement of the Fraunhofer lines, the spectrograph connected with this tower being very much more efficient than that connected with any refracting or reflecting telescope. The spectrum is spread out in a large room, which no one enters, and which is kept at a temperature constant to one one hundredth of a degree.

In Florence the Astronomical Observatory and Galileo's tower, which is restored, were visited. In the Museum of Physics I was greatly interested to see the two original telescopes of Galileo, with which he first saw the moons of Jupiter, the fiery ring of Saturn, the spots on the sun, the mountains on the moon, and Venus as a waxing and waning crescent.

[2] This method has been employed in the author's recent publication "The Ancient Inhabitants of the Canary Islands," Harvard African Studies, Vol. VII, Peabody Museum, Cambridge, Mass., 1925.

[1] In preparation of the plans for the Hall of Astronomy, for the use of students of all grades, which is now under consideration by the trustees of the American Museum of Natural History, Dr. G. Clyde Fisher was sent abroad during the summer of 1925. There is here printed an abstract of his report.

light sources taken from Professor Langley's work (Fig. 4). The difficulties attendant upon the accurate determination of the curve for the fire-fly are so great that we ought not to expect very great accuracy in this case. These curves, which in each case refer to the energy after pass-

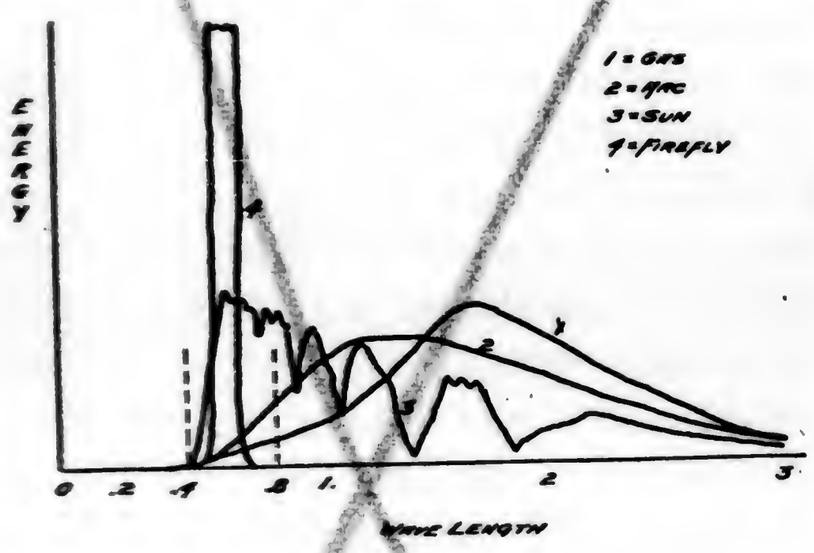

FIG. 4

ing through glass, which cuts off energy of long wave-lengths, represent the same quantities of radiant energy. While the sun is much more efficient than the gas flame or carbon arc, it still presents far the largest part of its energy in the invisible long wave-lengths (above 0.8), while the fire-fly seems to have its radiant energy confined to a narrow part of the visible spectrum.

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RACIAL DIFFERENCES IN MENTAL TRAITS[1]

ONE of the most agreeable and satisfying experiences afforded by intellectual pursuits comes from the discovery of a clean-cut distinction between things which are superficially much alike. The esthetic value of such distinctions may even outweigh their intellectual value and lead to sharp lines and antitheses where the only difference that exists is one of degree. A favorite opportunity for this form of intellectual exercise and indulgence is afforded by the observation of groups of men. The *type* of man composing each group—that is what we should like to find; and we hear much of the "typical" scientist, the typical business man, the typical Englishman or Frenchman, the typical southerner, the typical Bostonian. The type of any group stands as a sort of ideal within the group, and, more or less caricatured, as the butt of the wit of other groups. There is one peculiar fact about these types: you may have to search long for an individual who can be taken as a fair example. And when you have at last found the typical individual, you may be led to ask by what right he stands as the type of the group, if he is a rarity amidst it.

If we would scientifically determine the facts regarding a group of men, we should, no doubt, proceed to examine all the individuals in the group, or at least a fair and honest representation of them. The first fact that meets us when we proceed in this way is that the individuals differ from each other, so that no one can really be selected as representing the whole number. We do find, indeed, when we measure the stature or any other bodily fact, or when we test any native mental capacity, that the members of a natural group are disposed about an average, many of them lying near the average, and few lying far above or far below it; and we thus have the average as a scientific fact regarding the group. But the average does not generally coincide with the type, as previously conceived, nor do the averages of different groups differ so much as the so-called types differ. Moreover, the average is itself very inadequate, since it does not indicate the amount of variation that exists within the group—

[1] Address of the vice-president and chairman of Section H—Anthropology and Psychology—of the American Association for the Advancement of Science, Boston, 1909.

and this is one of the most important facts to be borne in mind in understanding any collection of individuals. It is specially important in comparing different groups of men, since the range of variation within either group is usually much greater than the difference between the averages of the groups. The groups overlap to such an extent that the majority of the individuals composing either group might perfectly well belong to the other.

No doubt statements like this will be readily accepted as far as concerns the different nations belonging to the same race. One could not seriously doubt that the nations of Europe, though they might differ slightly on the average, would so much overlap one another that, except for language and superficial mannerisms, the great majority of the members of one nation might be exchanged with a majority from another nation without altering the characteristics of either. But when we extend our view to all the peoples of the earth, the case would at first appear quite changed. Certainly whites and negroes do not overlap, to any extent, in color of skin, nor negroes and Chinamen in kinkiness of hair, nor Indians and Pygmies in stature. Such specialization of traits is, however, the exception. Whites and negroes, though differing markedly in complexion and hair, overlap very extensively in almost every other trait, as, for example, in stature. Even in brain weight, which would seem a trait of great importance in relation to intelligence and civilization, the overlapping is much more impressive than the difference; since while the brain of negroes averages perhaps two ounces lighter than the brain of Europeans, the range of variation within either race amounts to 25 ounces.

Our inveterate love for types and sharp distinctions is apt to stay with us even after we have become scientific, and vitiate our use of statistics to such an extent that the average becomes a stumbling-block rather than an aid to knowledge. We desire, for example, to compare the brain weights of whites and of negroes. We weigh the brains of a sufficient number of each race —or let us at least assume the number to be sufficient. When our measurements are all obtained and spread before us, they convey to the unaided eye no clear idea of a racial difference, so much do they overlap. If they should become jumbled together, we should never be able to separate the negroes from the whites by aid of brain weight. But now we cast up the average of each group, and find them to differ; and though the difference is small, we straightway seize on it as the important result, and announce that the negro has a smaller brain than the white. We go a step further, and class the white as a large-brained race, the negro as a small-brained. Such transforming of differences of degree into differences of kind, and making antitheses between overlapping groups, partakes not a little of the ludicrous.

We seem to be confronted by a dilemma; for the group as a whole is too unwieldy to grasp, while the average, though convenient, is treacherous. What we should like is some picture or measure of the *distribution* of a given trait throughout the members of a group; and, fortunately, such measures and pictures can be had. Convenient and compact measures of variability are afforded by the science of statistics, and are of no less importance than the average. But still better, because closer to the actual facts, are graphic or tabular pictures of the distribution of the trait, showing the frequency with which it occurs in each degree. The distribution of a trait is for some purposes more important than the average. Let us suppose, for instance,

that two groups were the same in their average mental ability, but that one group showed little variation, all of its members being much alike and of nearly the average intelligence, while the other group showed great variability, ranging between the extremes of idiocy and genius. It is evident that the two groups, though equal on the average, would be very unequal in dealing with a situation which demanded great mental ability. One master mind could supply ideas for the guidance of the group, and his value would far outweigh the load of simpletons which the group must carry.

If groups of men differ in average intelligence, this difference would have an influence on their effectiveness in mental work, and so, no doubt, on their advance in civilization. If groups differ in variability, this would probably have a still greater influence. There is one respect in which groups certainly do differ. They differ in size, and size is an important consideration, even from a purely biological point of view. The more numerous the individuals born into a group, the greater the absolute number of gifted individuals to be expected; and in some respects it is the absolute rather than the relative number of able men that counts. Besides this, the larger the group, the greater the chance of its producing a truly effective genius, just as, in the experiments of Burbank and other breeders, a vast number of plants are grown, in order to increase the chance of sports occurring.

One further consideration of this partly biological, partly statistical, nature should be brought forward before passing from preliminary remarks to the consideration of actual data. When the individuals composing a group are measured or tested in several traits, it is found that those who rank high in one trait do not always rank high in others. On the whole, there is more correspondence than opposition; an individual who ranks well in one trait is rather apt to rank well in others. The correlation, as we say, is positive, but it is far from perfect. The individuals most gifted with ability in war are not altogether the same individuals who are ablest in government, or in art or literature, or in mechanical invention. This fact is not only of importance in reaching a just conception of a group, but it should be considered in comparing different groups. The circumstances surrounding a group call for certain special abilities, and bring to the fore the individuals possessing these abilities, leaving in comparative obscurity those gifted in other directions. Judging the group largely by its prominent individuals, we get the impression that the group is gifted in certain lines, and deficient in others. A nation whose circumstances call for industrial expansion and the exploitation of natural resources gives prominence to those of its members who are successful in these pursuits, and leaves in obscurity many who have native capacity for military leadership. Should war come to such a community, time and bitter experience are often necessary before the leadership can be transferred from the previously eminent men to those obscure and often despised individuals who are capable of doing best service in the new direction. This lack of perfect correlation between various abilities makes it difficult to judge of the capacity of a group of men by casual observation; and we must accordingly discount largely the appearance of specialization of mental traits in different peoples.

All in all, the discovery of true inherent differences between races and peoples is an intricate task, and if we now turn to the psychologist to conduct an examination of different groups, and to inform us regarding their mental differences, we must not

allow him to present a hasty conclusion. His tests must be varied and thorough before we can accept his results as a serious contribution to this difficult subject. The psychologist may as well admit at once that he has little to offer; for, though the "psychology of peoples" has become a familiar phrase, and though books have been written on the subject, actual experimental work has so far been very limited in quantity.

One thing the psychologist can assert with no fear of error. Starting from the various mental processes which are recognized in his text-books, he can assert that each of these processes is within the capabilities of every group of mankind. All have the same senses, the same instincts and emotions. All can remember the past, and imagine objects not present to sense. All discriminate, compare, reason and invent. In all, one impulse can inhibit another, and a distant end can be pursued to the neglect of present incitations. Statements to the contrary, denying to the savage powers of reasoning, or abstraction, or inhibition, or foresight, can be dismissed at once. If the savage differs in these respects from the civilized man, the difference is one of degree, and consistent with considerable overlapping of savage and civilized individuals. The difference of degree calls for quantitative tests. But besides the traditional classification of mental powers, there is another of perhaps greater importance in studying differences between men. One individual differs from another not so much in power of memory, or of reasoning, or of attention, or of will, as in the sort of material to which he successfully applies these processes. One gives his attention readily to mathematics; he remembers mathematics easily; he reasons well on mathematical subjects; his will is strong in excluding distracting impulses when he is in pursuit of a mathematical goal. He may show none of these powers, in a high degree, in relation to music, or business, or social life; whereas another, totally inefficient in mathematics, may show equal powers of mind in another subject. The capacity to handle a given sort of subject matter is in part determined by native endowment, but is very responsive to training, and therefore is hard to test, because only individuals with equal training in any subject can be fairly tested and compared as to their native capacity to handle that subject. Thus it becomes hard to contrive a test for musical or mathematical or mechanical endowment which could fairly be applied to races having diverse trainings in these lines. This difficulty, moreover, infects our tests for such general powers as memory or reasoning, for a test has to deal with some sort of material, and success in passing the test depends on the familiarity of the material as well as on the power of mind which we design to test. We may suppose, indeed, that all of our tests, founded as they are on material which is familiar to us, will be more or less unfair to peoples of very different cultures and modes of life. The results of our tests need to be discounted somewhat—exactly how much we can not say—in favor of the primitive peoples tested.

We are now, it would seem, sufficiently entrenched in precautions and criticisms to admit the psychologist to our councils, and hear the results of his tests.

First, as to the senses. The point of special interest here is as to whether the statements of many travelers, ascribing to the "savage" extraordinary powers of vision, hearing and smell, can be substantiated by exact tests. The common opinion, based on such reports, is, or has been, that savages are gifted with sensory powers quite beyond anything of which the European is capable; though Spencer explains

that this is a cause of inferiority rather than the reverse, because the savage is thus led to rely wholly on his keen senses, and to devote his whole attention to sense impressions, to the neglect and atrophy of his intellectual powers. Ranke, however, on testing natives of Brazil, a race notable for its feats of vision, found that their ability to discern the position of a letter or similar character at a distance, though good, was not remarkable, but fell within the range of European powers. The steppe-dwelling Kalmuks, also renowned for distant vision, being able to detect the dust of a herd of cattle at a greater distance with the naked eye than a European could with a telescope, have also been examined; and their acuity was indeed found to be very high, averaging considerably above that of Europeans; yet only one or two out of the forty individuals tested exceeded the European record, while the great majority fell within the range of good European eyes. Much the same result has been obtained from Arabs, Egyptians and quite a variety of peoples. Among the most reliable results are those of Rivers on a wholly unselected Papuan population. He found no very exceptional individual among 115 tested, yet the average was somewhat better than that of Europeans. I had myself, through the kindness of Dr. McGee, the opportunity of testing individuals from quite a variety of races at the St. Louis Fair in 1904, and my results agree closely with those already cited, though I did not find any cases of very exceptional powers among about 300 individuals. There were a number who exceeded the best of the 200 whites whom I also tested under the same conditions, but none who exceeded or equaled the record of a few individuals who have been found in the German army. Indians and Filipinos ranked highest, averaging about 10 per cent. better than whites, when all individuals of really defective vision were excluded. The amount of overlapping is indicated by stating that 65–75 per cent. of Indians and Filipinos exceeded the average for whites. It did not seem possible, however, to assert anything like a correspondence between eyesight and the degree of primitiveness or backwardness of a people; since, for instance, the Negritos of the Philippine Islands, though much more primitive than the Malayan Filipinos in their mode of life, and, indeed, the most primitive group so far tested, were inferior to the Filipinos, and, in fact, as far as could be judged from the small number examined, no whit superior to whites. Nor does it seem possible, from results hitherto reported, to believe in a close correspondence between keen sight and dark skin, though it is true that pigment is important in several ways to the eye, and that therefore, as Rivers has suggested, the amount of pigmentation might be a factor in vision. But it does not seem to be specially the darkest races that show the keenest vision. We may perhaps conclude that eyesight is a function which varies somewhat in efficiency with difference of race, though with much overlapping. No doubt, however, the results as they stand need some qualification. On the one hand, inclusion of individuals with myopia and similar defects would lower the average of Europeans considerably more than that of most other races; so that the actual condition of eyesight differs more than the results show. On the other hand, it would not be fair to include near-sighted individuals, if what we wish to discover is native differences between peoples; for the different prevalence of myopia is certainly due to the differing uses to which the eye is put. And this matter of use may have considerable influence on the individuals not classed as near-sighted, and so admitted to the comparison.

Rivers has made an observation in connection with the test for eyesight, which I am able to confirm, and which is perhaps of much importance. He found that when the letter or character used in his test, the position of which had to be recognized at the greatest possible distance, was removed from him beyond the distance at which he felt that he could judge it, he could still guess it right nearly every time, though without confidence. By such guessing, one's record in this test can be bettered considerably; and careful study enables one to see the slight and blurred indications of position which form the basis of the guessing. Now it may well be that the occupations of civilized life breed a habit of dependence on clear vision, whereas the life of those who must frequently recognize objects at a great distance breeds reliance on slight indications, and so creates a favorable attitude for the test of eyesight. When this possibility is taken in connection with the deterioration of many European eyes from abuse, and in connection with the observed overlapping of all groups tested, the conclusion is not improbable that, after all, the races are essentially equal in keenness of vision. Even if small differences do exist, it is fairly certain that the wonderful feats of distant vision ascribed to savages are due to practise in interpreting slight indications of familiar objects. Both Rivers and Ranke, on testing some of the very individuals whose feats of keen sight seemed almost miraculous, found that, as tested, they had excellent but not extraordinary vision. A little acquaintance with sailors on shipboard is enough to dispel the illusion that such feats are beyond the powers of the white man.

The hearing of savages enjoys a reputation, among travelers, similar to that of their sight; but there can be little doubt that the cause is the same. In fact, the tests which have so far been made tend to show that the hearing of whites is superior. Such was the result of Myers on the Papuans, and of Bruner in his extensive series of measurements made at the St. Louis Fair. Only 15 per cent. of 137 Filipinos tested did as well as the average of whites; other groups made a somewhat better showing, but all seemed inferior on the average to whites. In spite of the experimental results, there is perhaps reason to doubt that the hearing of whites is essentially and natively much superior to that of other races. Civilized life protects the ear from some forms of injury to which it is exposed in more primitive conditions; and, then, the question of cleanliness must be considered in regard to the meatus. Besides, the ear is known to be highly susceptible of training in the perception of particular sorts of sound—as overtones and difference tones—and it is likely enough that the watch ticks and similar clicks used in the tests are not equally within the repertory of all peoples.

Much the same can be said regarding keenness of smell. On account of the high olfactory powers of dogs and some other lower animals, it has often seemed natural and proper that this sense should be highly developed among savages; and feats of primitive folk have been reported quite analogous to those already referred to under sight and hearing. No doubt here again, special interests and training are responsible, since what few tests have been made tend to show no higher acuity of smell among negroes and Papuans than among Europeans.

The sense of touch has been little examined. McDougall found among the Papuans a number with extremely fine powers of discrimination by the skin. The difference between two points and one could be told by these individuals even when the

two points were brought very close together; on the average, the Papuans tested excelled Europeans considerably in this test. On the other hand, Indians and Filipinos, and a few Africans and Ainu, tested in the same manner, seem not to differ perceptibly from whites.

The pain sense is a matter of some interest, because of the fortitude or stolidity displayed by some races towards physical suffering. It may be, and has been conjectured, that the sense for pain is blunt in these races, as it is known to be in some individuals who have allowed themselves to be burned without flinching, and performed other feats of fortitude. The pain sense is tested by applying gradually increasing pressure to some portion of the skin, and requiring the person tested to indicate when he first begins to feel pain. Now, as a matter of fact, the results of McDougall on the Papuans, and those of Dr. Bruner and myself on Indians, Filipinos, Africans and Ainu, are in close agreement on this point. Greater pressure on the skin is needed to produce pain in each of these races than in whites. This is the average result, but in this test the distribution of the cases is specially important. Though most whites feel pain at or about a certain small pressure, there is quite a respectable minority who give no sign till much higher pressures are reached, their results corresponding very closely to those of the majority of Indians. And similarly, a minority of Indians feel pain at much lower pressures than the bulk of their fellows, falling into the ranks of the white man. In each group, the distribution is bimodal, or aggregated about two points instead of one; but whites are principally aggregated about the lower center, and Indians and other races about the higher center. Introspection comes to our aid in explaining this anomaly, for it shows that there is some difficulty in telling just when the pressure becomes painful. If one is satisfied with slight discomfort, a moderate pressure will be enough; but if a sharp twinge is demanded, the pressure must be considerably increased. Most whites, under the conditions of the test, are satisfied with slight discomfort, while my impression in watching the Indians was that they were waiting to be really hurt. The racial difference would accordingly be one in the conception of pain, or in understanding the test, rather than in the pain sense.

On the whole, the keenness of the senses seems to be about on a par in the various races of mankind. Differences exist among the members of any race, and it is not improbable that differences exist between the averages of certain groups, especially when these are small, isolated and much inbred. Rivers has in fact found such small groups differing considerably from whites in the color sense. One such group showed no cases of our common color blindness or red-green blindness, while another group showed an unusually large percentage of color-blind individuals. In the larger groups, the percentage of the color-blind is, very likely, about constant, though the existing records tend to show a somewhat lower proportion among Mongolians than among whites. Very large numbers of individuals need, however, to be tested in order to determine such a proportion closely; even among Europeans, the proportion can not yet be regarded as finally established. One thing is definitely shown by the tests that have been made for color blindness in various races: no race, however primitive, has been discovered in which red-green blindness was the universal or general condition; and this is a fact of some interest in connection with the physiology of color vision, for it seems probable that red-green blindness, since it

is not by any means a diseased condition, represents a reversion to a more primitive state of the color sense. If this is so, no race of men remains in the primitive stages of the evolution of the color sense; the development of a color sense substantially to the condition in which we have it, was probably a pre-human achievement.

In the actual history of the discussion of the color sense in various races, quite a different view of the evolution has been prominent. It was Gladstone who first, as an enthusiastic student of Homer, was struck by the poverty of color names in ancient literature, and who suggested that the Greeks of the Homeric age had a very imperfectly developed eye for color. He was especially impressed by the application of the same color name to blue and to gray and dark objects. Geiger, adhering to the same sort of philological evidence, broadened its scope by pointing out the absence of a name for blue in other ancient literatures. It is indeed curious that the sky, which is mentioned hundreds of times in the Vedas and the Old Testament, is never referred to as blue. The oldest literatures show a similar absence of names for green. Geiger found that names for black, white and red were the oldest, and that names for yellow, green and blue have appeared in that order. He concluded that the history of language afforded an insight into the evolution of the color sense, and that, accordingly, the first color to be sensed was red, the others following in the same order in which they occur in the spectrum. Magnus found that many languages at the present day were in the same condition as that shown in the ancient Greek, Hebrew and Sanscrit. Very many, perhaps the majority, have no specific name for blue, and a large proportion have none also for green. A smaller number are without a name for yellow, while nearly all have a name for red. It seemed that the backward races of to-day had just reached the stage, in the matter of color sensation, which was attained by other races some thousands of years ago. The underlying assumptions of this argument are interesting—the notion that the list of sensations experienced by a people must find expression in its vocabulary; and the conception of certain peoples now living as really primitive. Fortunately, Magnus submitted this theory to the test of facts, by supplying travelers and traders with sets of colors, by which various peoples were tested, first, as to their ability to name the colors in their own languages, and second, as to their power to recognize and distinguish the colors. The results of this inquiry were that names were often lacking for blue and green, but that every people was able to perceive the whole gamut of colors known to the European. This was a severe blow alike to the philological line of argument and to the ready assumption that early stages of evolution were to be found represented in the backward peoples of to-day. Accepting the facts as they stood, Magnus still felt that there must be some physiological or sensory reason for the curious lack of certain color names in many languages; and he therefore suggested that blue and green might be less vividly presented by the senses of many tribes, and that, being duller to their eyes than to Europeans, these colors did not win their way into the language. The theory was, however, practically defunct for many years till Rivers recently took it up, as the result of tests on several dark-skinned peoples. His test called for the detection of very faint tints of the various colors, and the result was that, as compared with twoscore educated English whom he also tested, these peoples were somewhat deficient in the detection of faint tints of blue—and also of yellow—but not of red. One group, indeed, was superior to the English in red. The results made it seem probable to Rivers that blue was indeed a somewhat less vivid color to dark-skinned races than to Europeans, and he suggested that pigmentation, rather than primitiveness, might be the important factor in producing this difference. A blue-absorbing pigment is always present in the retina, and the amount of it might very well be greater in generally pigmented races. The suggestion is worth putting to a further test; but, meanwhile, the difference obtained by Rivers in sensitiveness to blue needs to be received with some caution, since the Europeans on whose color sense he relies for comparison were rather few in number, educated and remarkably variable among themselves. We were able, at St. Louis, to try on representatives of a number of races a difficult color matching test, so different indeed from that of Rivers that our results can not be used as a direct check on his; with the result that all other races were inferior to whites in their general success in color matching, but that no special deficiency appeared in the blues. We also could find no correlation between ill success in this test and the degree of pigmentation. On the whole, the color sense is probably very much the same all over the world.

That linguistic evidence is a very treacherous guide to the sensory powers of a people is well seen in the case of smell. Certainly many odors are vivid enough, yet we have no specific odor names. Only a psychologist would require a complete vocabulary of sensations; practical needs lead the development of language in quite other directions.

When we turn from the senses to other functions, the information which the psychologist has to offer becomes even more scanty.

Some interest attaches to tests of the speed of simple mental and motor performances, since, though the mental process is very simple, some indication may be afforded of the speed of brain action. The reaction time test has been measured on representatives of a few races, with the general result that the time consumed is about the same in widely different groups. The familiar "tapping test," which measures the rate at which the brain can at will discharge a series of impulses to the same muscle, was tried at St. Louis on a wide variety of folk, without disclosing marked differences between groups. The differences were somewhat greater when the movement, besides being rapid, had to be accurate in aim. The Eskimos excelled all others in this latter test, while the poorest record was made by the Patagonians and the Cocopa Indians—which groups were, however, represented by only a few individuals. The Filipinos, who were very fully represented, seemed undeniably superior to whites in this test, though, of course, with plenty of overlapping.

The degree of right-handedness has been asserted to vary in different races, and the favoring of one hand has been interpreted as conducive to specialization and so to civilization. We were, however, unable to detect any marked difference in the degree of right-handedness in different races, as tested by the comparative strength, quickness or accuracy of the two hands. The Negritos, the lowest race examined, had the same degree of right-handedness as Filipinos, or Indians, or whites.

We are probably justified in inferring from the results cited that the sensory and motor processes, and the elementary brain activities, though differing in degree from one individual to another, are about the same from one race to another.

Equitable tests of the distinctly intel-

lectual processes are hard to devise, since much depends on the familiarity of the material used. Few tests of this nature have as yet been attempted on different races.

There are a number of illusions and constant errors of judgment which are well-known in the psychological laboratory, and which seem to depend, not on peculiarities of the sense organs, but on quirks and twists in the process of judgment. A few of these have been made the matter of comparative tests, with the result that peoples of widely different cultures are subject to the same errors, and in about the same degree. There is an illusion which occurs when an object, which looks heavier than it is, is lifted by the hand; it then feels, not only lighter than it looks, but even lighter than it really is. The contrast between the look and the feel of the thing plays havoc with the judgment. Women are, on the average, more subject to this illusion than men. The amount of this illusion has been measured in several peoples, and found to be, with one or two exceptions, about the same in all. Certain visual illusions, in which the apparent length or direction of a line is greatly altered by the neighborhood of other lines, have similarly been found present in all races tested, and to about the same degree. As far as they go, these results tend to show that simple sorts of judgment, being subject to the same disturbances, proceed in the same manner among various peoples; so that the similarity of the races in mental processes extends at least one step beyond sensation.

The mere fact that members of the inferior races are suitable subjects for psychological tests and experiments is of some value in appraising their mentality. Rivers and his collaborators approached the natives of Torres Straits with some misgivings, fearing that they would not possess the necessary powers of sustained concentration. Elaborate introspections, indeed, they did not secure from these people, but, in any experiment that called for straightforward observation, they found them admirable subjects for the psychologist. Locating the blind spot, and other observations with indirect vision, which are usually accounted a strain on the attention, were successfully performed. If tests are put in such form as to appeal to the interests of the primitive man, he can be relied on for sustained attention. Statements sometimes met with to the effect that such and such a tribe is deficient in powers of attention, because, when the visitor began to quiz them on matters of linguistics, etc., they complained of headache and ran away, sound a bit naïve. Much the same observations could be reported by college professors, regarding the natives gathered in their class rooms.

A good test for intelligence would be much appreciated by the comparative psychologist, since, in spite of equal standing in such rudimentary matters as the senses and bodily movement, attention and the simpler sorts of judgment, it might still be that great differences in mental efficiency existed between different groups of men. Probably no single test could do justice to so complex a trait as intelligence. Two important features of intelligent action are quickness in seizing the key to a novel situation, and firmness in limiting activity to the right direction, and suppressing acts which are obviously useless for the purpose in hand. A simple test which calls for these qualities is the so-called "form test." There are a number of blocks of different shapes, and a board with holes to match the blocks. The blocks and board are placed before a person, and he is told to put the blocks in the holes in the shortest possible time. The key to the situation is here the matching of blocks and holes by their shape; and the part of intelligence is to hold firmly to this obvious necessity, wasting no time in trying to force a round block into a square hole. The demand on intelligence certainly seems slight enough; and the test would probably not differentiate between a Newton and you or me; but it does suffice to catch the feeble-minded, the young child, or the chimpanzee, as any of these is likely to fail altogether, or at least to waste much time in random moves and vain efforts. This test was tried on representatives of several races, and considerable differences appeared. As between whites, Indians, Eskimos, Ainus, Filipinos and Singhalese, the average differences were small, and much overlapping occurred. As between these groups, however, and the Igorot and Negrito from the Philippines and a few reputed Pygmies from the Congo, the average differences were great, and the overlapping was small. Another rather similar test for intelligence, which was tried on some of these groups, gave them the same relative rank. The results of the test agreed closely with the general impression left on the minds of the experimenters by considerable association with the people tested. And, finally, the relative size of the cranium, as indicated, roughly, by the product of its three external dimensions, agreed closely in these groups with their appearance of intelligence, and with their standing in the form test. If the results could be taken at their face value, they would indicate differences of intelligence between races, giving such groups as the Pygmy and Negrito a low station as compared with most of mankind. The fairness of the test is not, however, beyond question; it may have been of a more unfamiliar sort to these wild hunting folk than to more settled groups. This crumb is, at any rate, about all the testing psychologist has yet to offer on the question of racial differences in intelligence.

In the absence of first-hand study of the mental powers of different races, folk psychology resorts to a comparison of their civilizations and achievements. This is the method by which we habitually compare the intelligence of individuals, judging capacity by performance, the tree by its fruits; and such judgments, though subject to occasional error, are probably in the main reliable. Why should we not extend the method to the comparison of groups, and say that a group possessing a high civilization has probably a high average intelligence, while a wild savage race is mentally poorly endowed? The first difficulty in employing the method is to obtain a just estimate of the cultures to be compared. First impressions regarding alien folk, derived from the reports of travelers, are usually wide of the mark. Only the patient and prolonged labors of the ethnologist can inform us as to what a tribe does and thinks; and where such studies have been made, it is found that a backward culture, such as that of the natives of Australia, has much more substance, and affords much wider scope for mental activity, than the early reports indicated.

The difficulty of inferring the mental endowment of a group from its stage of culture is well brought out by applying this method to the comparison of different epochs in the history of a nation. German culture to-day is much advanced from the days of Cæsar; shall we infer that the mental endowment of the Germans has advanced in like measure? Biologically, the interval, measured in generations, is not long, and from all biological considerations it is improbable that any advance in mental endowment has occurred. The difference in material civilization does not mean that

the German of to-day is, on the average, gifted with more native inventiveness or business ability than his ancestors sixty generations ago. The difference in the arts and sciences does not mean that the German of to-day is naturally more studious, or scientific, or musical. The more settled condition of society does not imply greater native capacity for industry or government. The disappearance of old superstitions does not imply that later generations were born without the tendencies to superstition which characterized their fathers. We are still not many generations removed from witchcraft, curses, magic and the like savage beliefs and practises, and we can not reasonably believe our recent forefathers to have been naturally more savage than we are. When, for psychological purposes, we compare the culture of Europe with that of Africa, we should not leave out of account the Children's Crusade, or the Inquisition, or the Wars of the Roses. And if we attempt to use the state of civilization as a measure of racial intelligence, we must somehow adapt the method so that it shall give the same results, whether earlier or later stages in the culture of a group be taken as the basis for study.

In reality, the civilization possessed by a generation can not be used as a measure of the intelligence of that generation any more than an individual's property can be taken as a measure of his business ability. The greatest part of the civilization of a generation is bequeathed to it, and only the increase which it produces can be laid to its credit. If we could compare the rate of progress in different groups, this might serve as a measure of intelligence; and certainly some peoples are more progressive than others. Before adopting such a test, we should understand the mechanism of progress—a matter which belongs only in part to psychology.

Progress depends first of all on human inventiveness—so much will probably be allowed. Under the head of inventions should be included, not only mechanical devices, but works of art and government, business enterprises and changes in custom, so far as any of these demand originality in their producers. Science and all increase in knowledge should also be included, since the process of discovery differs but little from the process of invention. In both the essential mental act seems to be a bringing together of things that are found apart, or a pulling apart of what occurs together. In fact, both of these processes, the combining or associating, and the analytic or discriminating, go on together, since we see something new in a thing when we are reminded by it of something else and different. There is a suggestion of the accidental in all invention, since it depends on "happening to notice something," or "happening to be reminded of something." You can not be sure that a person will make a discovery, even when you supply him with the elements which would combine to produce it. Oftentimes, in reading the history of scientific progress, one is surprised that a certain discovery was not made by some man who had apparently everything before him to lead to it. Invention is of the nature of a spontaneous variation, and this accidental character is very important in understanding the mechanism of progress.

On the other hand, since one can not be reminded of things entirely unknown, invention depends on previously acquired knowledge, and the inventiveness of an individual must take a direction prepared for him by the social group among which he lives. A large share of the inventiveness of the Australian natives seems to be directed into the channels of magic and ceremony. The finished product of one mind's inventiveness becomes raw material for another, and invention of all sorts is distinctly a cooperative enterprise.

Invention is said to be mothered by necessity; and the proverb is no doubt true in the main, though curiosity and experimentation belong among the play instincts. But, in any case, the necessity must not be too dire, for some degree of leisure is demanded if anything novel is to be thought of, and rapid progress is only possible when individuals can be allowed to accumulate the special knowledge which may serve as the raw material for their inventive activity. Divisions of labor, guilds, universities, legislatures, investigating commissions, permanent research bureaus—each of which is, genetically, a series of inventions—are dependent for their existence on a certain degree of leisure, while they in turn provide more leisure and opportunity for further advance. They are inventions which accelerate the progress of invention. There are thus many factors besides the intellectual endowment of a generation which go to determine the progress which it shall make. The spur of necessity, the opportunity afforded by leisure, the existing stock of knowledge and inventions and the factor of apparent accident or luck have all to be considered.

A still further factor is the size of the group, which is deserving of renewed attention. Not only does a large group afford more opportunity for division of labor and special institutions for research, but the biological consideration already mentioned should be emphasized. The contributions to progress of the average man are small, the inventions of moment arising in the brains of a small fraction of the group. A large group provides a greater number of inventive minds, and it is rather the absolute number of such than their proportion to the whole population that determines the progress of invention within a group. The "group" needs to be redefined from the point of view of invention. If knowledge and inventions pass back and forth between two nations or races, the inventive minds of both are brought into cooperation, and the group is by so much enlarged. From the point of view of progress, however, the question is not simply how many inventive minds are brought into cooperation, but how free and rapid the communication is between them. At the present time, a discovery originating anywhere in Europe or its colonies is quickly known by specialists in all parts, and may promptly fructify the mind of a distant investigator, leading to a fresh advance. The invention of printing and of rapid means of communication must be credited with a large share of the rapid progress which has been made by the last few generations. Much also must be credited to the invention of steam power, which has vastly multiplied the size of the European group, in an economic sense, and set free many minds of ability for productive thinking. The very idea of the advancement of science and invention as an end to be striven for is to be classed as an invention, and a rather recent one; and it too is an accelerator.

Such considerations provide at least a partial explanation of the different rates of progress in different generations, and among different races. Whether they explain everything could perhaps only be determined by a drastic experiment, which it will do no harm to imagine, though the question will never be settled in this convincing way.

Let two or more habitats, isolated from each other and from the rest of the world, and as nearly as possible alike, be chosen,

and peopled by two equal groups of children, selected from some highly civilized nation, and so selected as to represent fairly the distribution of mental and physical traits among that nation. For every individual in the first group, let there be a practically identical individual in the second. Let these groups of children be introduced into their new homes in infancy, and, by some quasi-miraculous means, let them be all preserved to maturity, and then let them, and their descendants, be left entirely to their own devices, without fire, or a language, or other modern improvements. To watch such a spectacle from afar would be thrilling, if not too pitiful. We can readily grant that the infant communities would begin at the very zero of civilization, and that their progress, for many generations, would seem excessively slow. But the real point of the experiment is to inquire whether these two equal groups, alike in numbers, in heredity and in environment, would remain alike, and progress at equal rates. Probably they would not. We must allow for a large element of chance in the mating of males and females within each group, and consequently for changes and inequalities in the distribution and correlation of traits—changes which need not alter the average of either group. We must allow for spontaneous variation in the offspring, another accidental factor by virtue of which a really inventive and effective individual, or conjunction of such, would almost certainly arise in one group earlier than in the other, and give the advance of one group an impetus which might be felt through many generations, and carry this group far ahead of the other. And we must allow also for the accidental factor in invention. Even though the genius of one group was paired by an equal genius in the other, it is improbable that both would invent the same things. One might invent a hunting implement, and the other a fishing implement; and by this accident the direction of development might be settled for each group. If we closed the experiment after a thousand generations, we should probably find two peoples of different languages, different customs, and cultures divergent in many respects. The supposed result may be taken as an assertion of the importance of accident in determining the destiny of peoples. Obscure causes are no doubt at work beneath the accidents, but we can not trace them, nor reasonably state them in terms of racial superiority and inferiority.

It would seem that size of groups, and accidental factors, exert so much influence on the rate of advance in civilization that differences of culture could possibly be explained without supposing the mental endowments of the races to differ. Whether the existing races of men do or do not differ in such a trait as inventiveness is another and more difficult problem, the settlement of which must be left to time and educational experiments. The experiments must be continued for several generations, in order to equate social traditions. Regarding the negroes of the south, I am informed by a gentleman who has spent twenty years in educating them that a distinct advance is perceptible during this period, especially among the children of educated parents. These have more educational ambition, enter school earlier and have less to unlearn. The educational experiment, as far as it has gone, thus shows that much time will be needed before a clear result is reached.

Meanwhile it may be allowed to add one more general consideration by asking whether causes of a biological nature can be seen to be at work in human history, such as would differentiate the races intellectually, and, in particular, such as to

raise up, in some part of the world, a race superior to the stock from which it sprang.

Natural selection has been suggested as such a cause. Life in the tropics, it has been said, is too easy to demand much inventiveness or forethought, but a migration to colder regions, where the banana does not grow, would make mental activity imperative, and select those individuals who were able to respond, so producing a superior race. There is a difficulty here, since we should expect natural selection to begin by lopping off the most poorly endowed fraction of the population, with the result, finally, that the lower range of intelligence should disappear from the higher races. The lowest grade of intelligence in Europe should accordingly be higher than the lowest grade in Africa. But this is probably not the case; the range of intelligence reaches as low in one as in the other. The distributions of intelligence in the two also overlap to quite an extent. Extensive experiment has shown that Africans can maintain existence in the temperate zone.

Sexual selection, or, more properly, mating customs, furnish a more promising factor. If a tendency could be detected in any population for the most intelligent members to mate with each other, the result would be, not indeed a raising of the average intelligence, since the less intelligent would also mate with each other, but an increase of the variability, and greater chance of the birth of very superior individuals. A caste system might operate in this way, since the founders of aristocratic families probably won admission to the caste partly by virtue of intelligence, and their descendants would tend, by heredity, to exceed the average intelligence of the population. Marriage confined to the caste would thus tend to mate superior individuals with each other, and might, in the course of generations, raise the upper limit of intelligence. Customs of mating within one's rank obtain among the aristocracy and royalty of Europe, and may have been a factor in increasing the number of superior intelligences. But too much can not be attributed to this factor, since the selection has been by classes, and not by individuals. Royalty, while marrying within its rank, has not usually chosen the most gifted individual available. Its selection has been relatively inefficient from the standpoint of royal eugenics. Certainly the upper reach of European intelligence has not been the result of breeding by castes; for, though royalty has indeed produced a disproportionate number of high intelligences, equally able individuals have, as a matter of fact, risen from humble birth. Moreover, marriage in all parts of the world is largely governed by considerations of family standing and wealth, so that the same sort of influence toward variability is everywhere operative. The dead level of intelligence, which is sometimes supposed to obtain among backward races, is not borne out by psychological tests, since individual differences are abundantly found among all races, and, indeed, the variability of different groups seems, from these tests, to be about on a par.

Selection by migration is also to be considered. When individuals leave their group and go to a new country, it would seem that those who emigrate must differ, on the average, from those who remain behind. An adventurous and enterprising spirit, perhaps, would be characteristic of the emigrants, and so of the new people which they helped to form. On the other hand, the ne'er-do-well and the criminal might also be induced to emigrate. The selective influence of migration would not be all in one direction, and the net result could not easily be predicted. Since we are now witnessing, though little compre-

hending, this process of migration as it contributes to form a people of the future, information regarding the kind of selective influence exerted by migration would have a practical value. Wisdom would dictate that the nation which is in process of formation should exert some selective influence on its own account, but, from all the facts in hand, the part of wisdom would be to select the best individuals available from every source, rather than, trusting to the illusory appearance of great racial differences in mental and moral traits, to make the selection in terms of races or nations.

R. S. Woodworth
Columbia University

Scientific Notes and News

The Geological Society of London has awarded the Wollaston medal to Professor W. B. Scott, of Princeton University, "in recognition of his many valuable contributions to our knowledge concerning the mineral structure of the earth, and especially in relation to the tertiary mammalia and tertiary stratigraphical geology of North America and Patagonia."

At the recent meeting in Boston, Dr. George A. Piersol, professor of anatomy, was elected president of the American Association of Anatomists.

Drs. Charles H. Frazier, John H. Musser, David L. Edsall and A. C. Abbott have been appointed by Provost Harrison, of the University of Pennsylvania, managers of the Phipps Institute for the purpose of entering upon the construction of the new building with the money contributed by Mr. Phipps.

Mr. A. F. Woods left Washington on January 23 to take up his new duties at the University of Minnesota. On the evening of January 22 he was tendered a reception by the Bureau of Plant Industry, at which time a silver service was presented to him in commemoration of his long service in the bureau. Addresses were made by Assistant Secretary Hays, Mr. D. G. Fairchild and Dr. Erwin F. Smith.

A dinner in honor of Professor James Truman, emeritus professor in the University of Pennsylvania Dental School, was given at the Waldorf-Astoria, in New York City, on January 23.

On the occasion of the inauguration of Dr. H. H. Apple, as president of Franklin and Marshall College, on January 7, the degree of LL.D. was conferred on Dr. Edgar F. Smith, vice-provost of the University of Pennsylvania and professor of chemistry, and on Dr. J. H. Musser, professor of clinical medicine of the University of Pennsylvania.

Dr. Albert Ladenburg, professor of chemistry at Breslau, has been elected a corresponding member of the Paris Academy of Sciences.

Dr. Otto N. Witt, professor of industrial chemistry in the Berlin School of Technology, has been made an honorary member of the Royal Institution, London.

Mr. T. Case, Waynflete professor of moral and metaphysical philosophy and president of Corpus Christi College, Oxford University, has resigned his professorship.

Dr. C. O. Townsend, pathologist in charge of sugar beet investigations, Bureau of Plant Industry, has resigned from the government service. He left Washington on January 17, for Garden City, Kansas, where he has accepted a position as consulting agriculturist for a large sugar beet company.

Professor F. W. Morse, formerly chemist of the New Hampshire Experiment Station and professor of organic chemistry in the New Hampshire College, has been engaged temporarily as research chemist at the Massachusetts Agricultural Experiment Station.

The board of directors of the Metropolitan Life Insurance Company has appointed Dr. Jay Bergen Ogden, to be assistant medical director of the company.

Dr. Hans Hallier, conservator of the Royal Herbarium at Leyden, has been visiting the botanical gardens of the United States.

Photograph and copyright by Austin A. Breed

A SPANISH GYPSY

This beautiful girl of Granada represents the highest type of the aristocracy of gypsydom. She would lose caste at once if she were to work, but it is perfectly all right for her to beg or steal—your heart.

Nat. Geographic Magazine, March 1917.

Photograph and Copyright by Austin A. Breed

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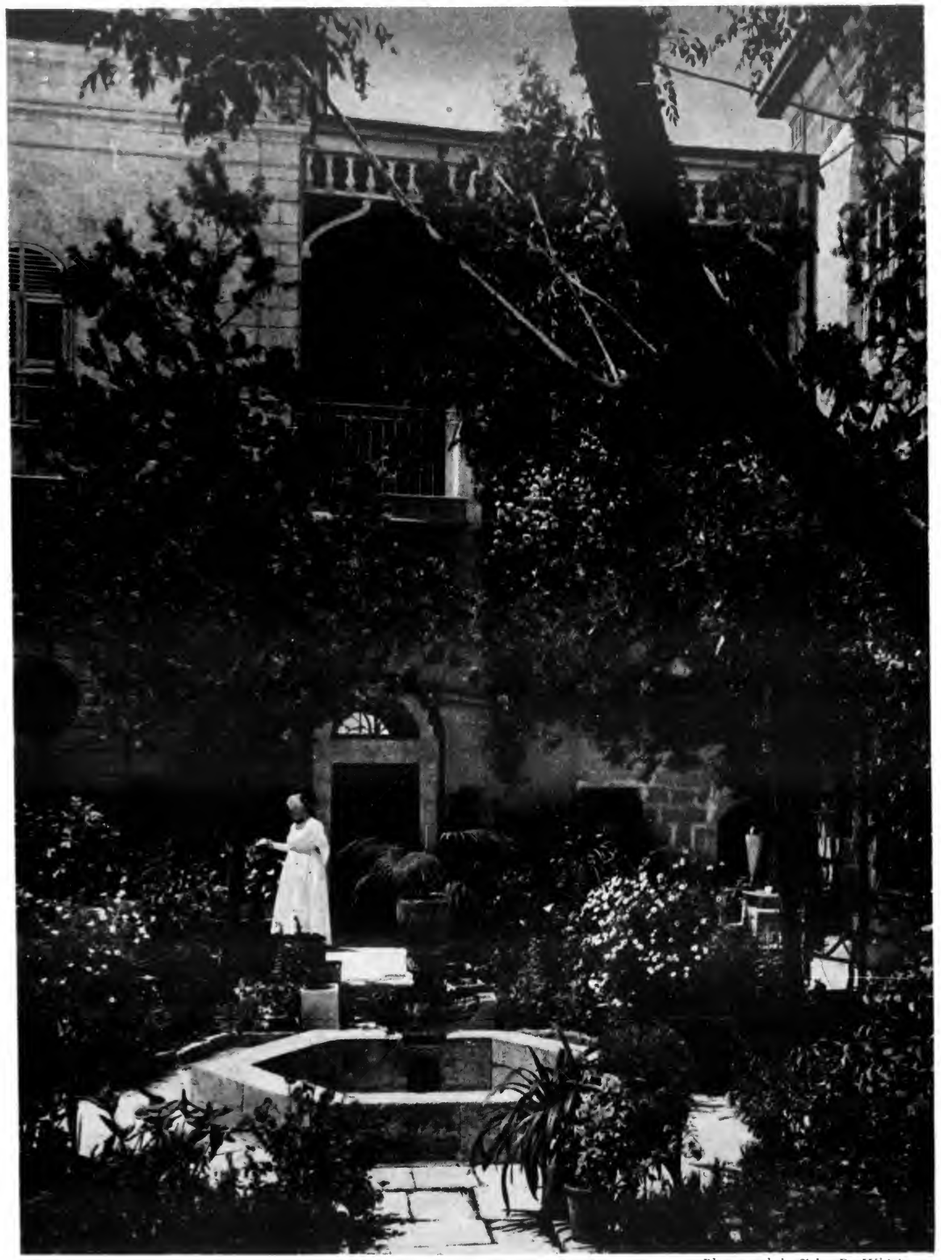


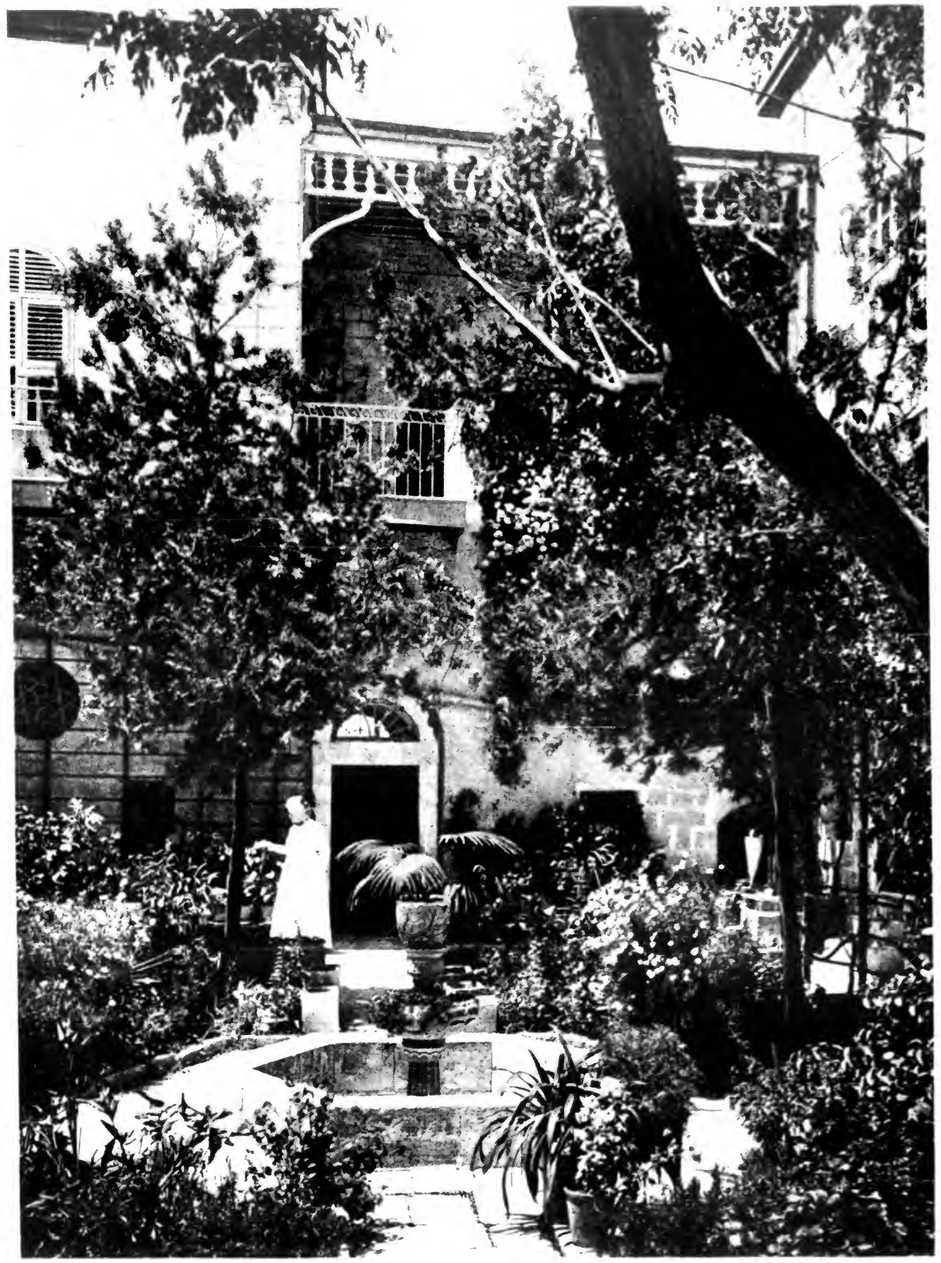
Photograph by John D. Whiting

A GARDEN IN THE HOLY LAND

In days gone by, many of the city houses of the more prosperous residents of Jerusalem were built around an open court so that the Moslem women, although secluded, could have a garden, thus affording a measure of outdoor life. This is now the home of an American.

AN AUTOMOBILE OF THE ORIENT

The donkey is the patient burden-bearer of Northern Africa just as he is in many other parts of the world. He has carried heavy loads from time immemorial—both passengers and freight—and makes no protest until the accumulation of trouble swells his heart and he seeks relief through an impassioned bray.



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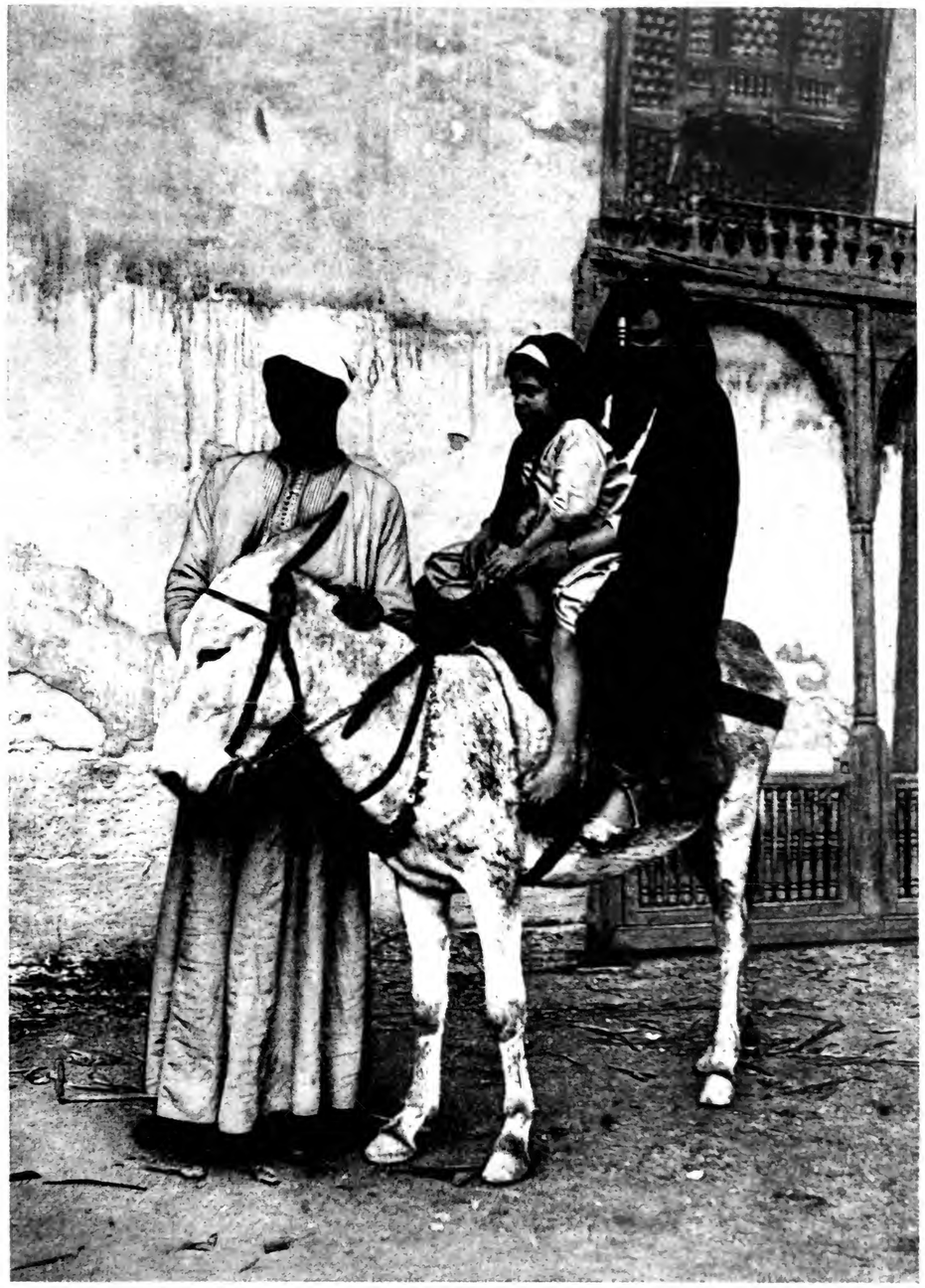

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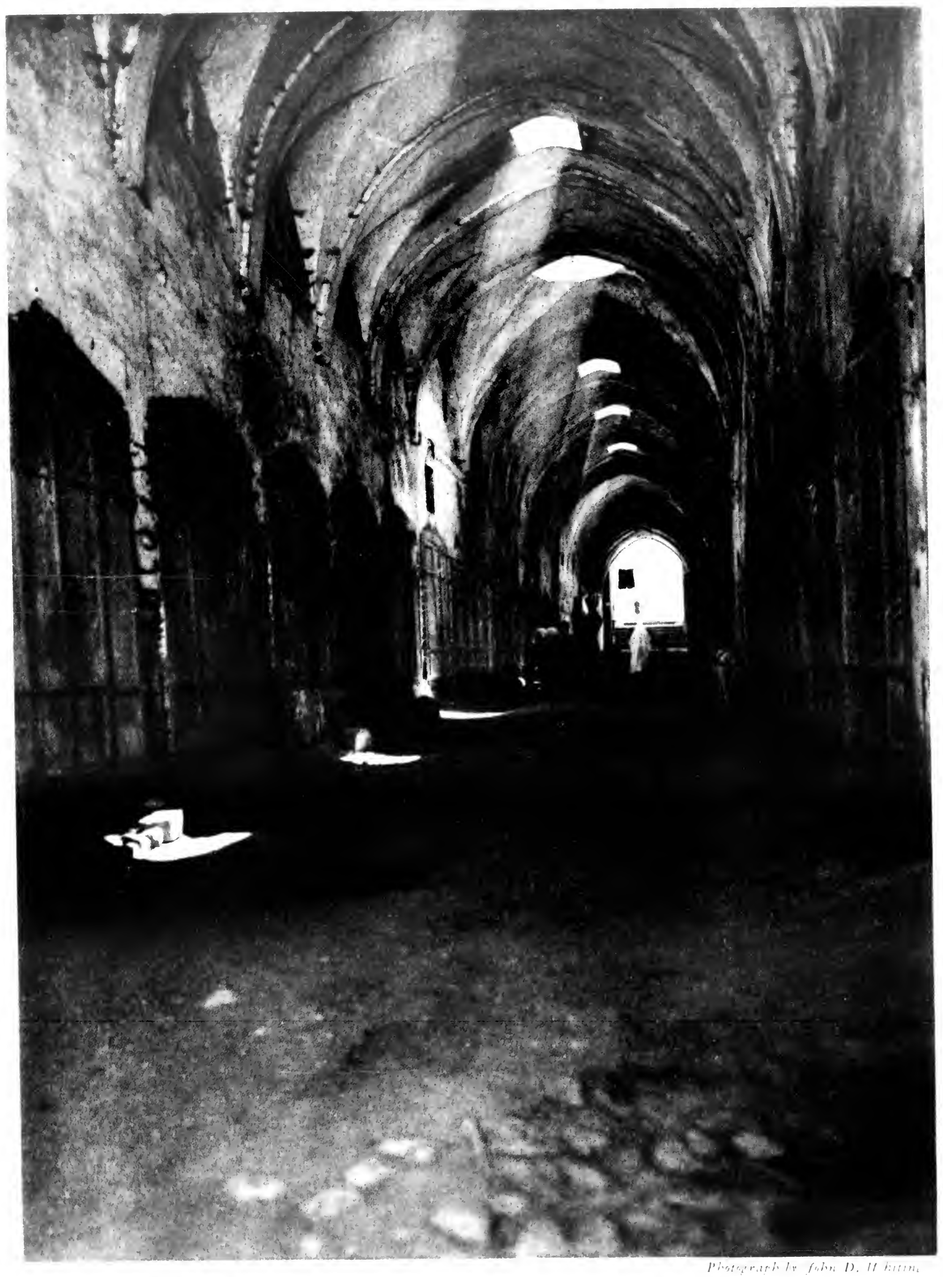
THE ABANDONED COTTON MARKET, JERUSALEM

One of the entrances to the temple area within which stands the Mosque of Omar. There is a biblical atmosphere about this old passageway, the cobbles of which have been worn smooth by the weary feet of the ancients.

A DESERT FLOWER

"Somewhere in the Sahara" lived this child of the Desert until she came to Biskra, the "Garden of Allah," to earn her dowry as a dancer. One would imagine that she is dreaming of some turbaned knight left behind and counting the days until she may return to her natal tent.

Retake of Preceding Frame



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THE GATE OF JAIPUR, INDIA

Built of pink stucco and surrounded by a great wall with many towers, this city is the chief financial center of the state of Rajputana and a commercial emporium of no mean proportions. Paved streets, some a hundred feet wide, divide the city into six equal sections. Founded in 1728 by the great Maharajah Jai Singh II, it was named for him, and its chief attraction is his magnificent palace in the center of the city. It is the only city in India laid out in rectangular blocks.

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"Full many a flower is born to blush unseen,
And waste its sweetness on the desert air."

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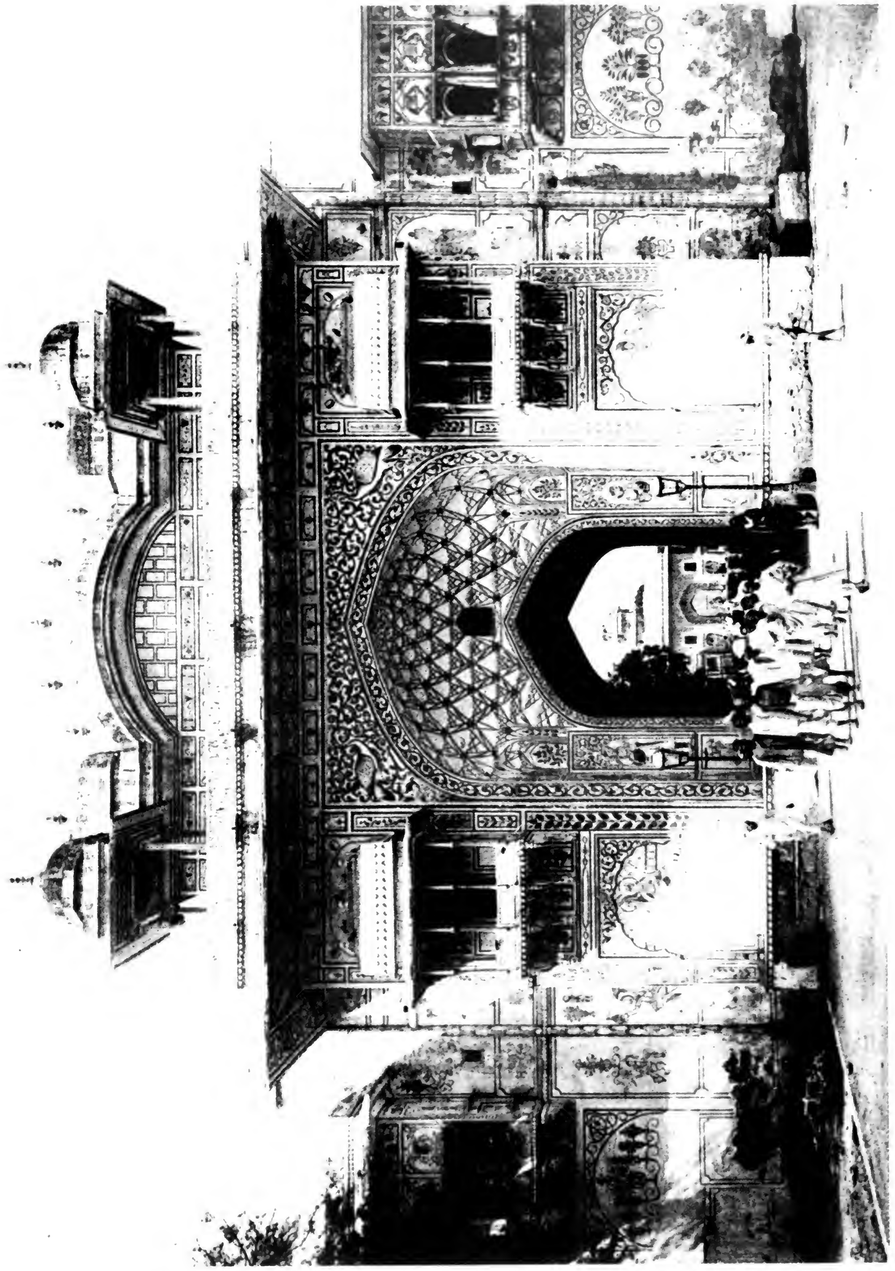

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This old beggar of Tangier, Morocco, is singing a monotonous, wailing chant to attract the attention of the passers-by. He is a cheerful soul, however, and a pleasant contrast to some of the members of his brotherhood who capitalize their deformities.

Photograph and copyright by Austin A. Breed

NIGHT IN TETUAN, MOROCCO

Even in daylight one is impressed with the mysterious atmosphere pervading the quiet streets in the old Moorish quarter of Tetuan. Here one is among a strange and alien people, widely different in religion and custom. The eerie quality of the streets is accentuated at night, and the soft radiance of the moonlight and even an occasional flickering lamp are welcome to the wayfarer.

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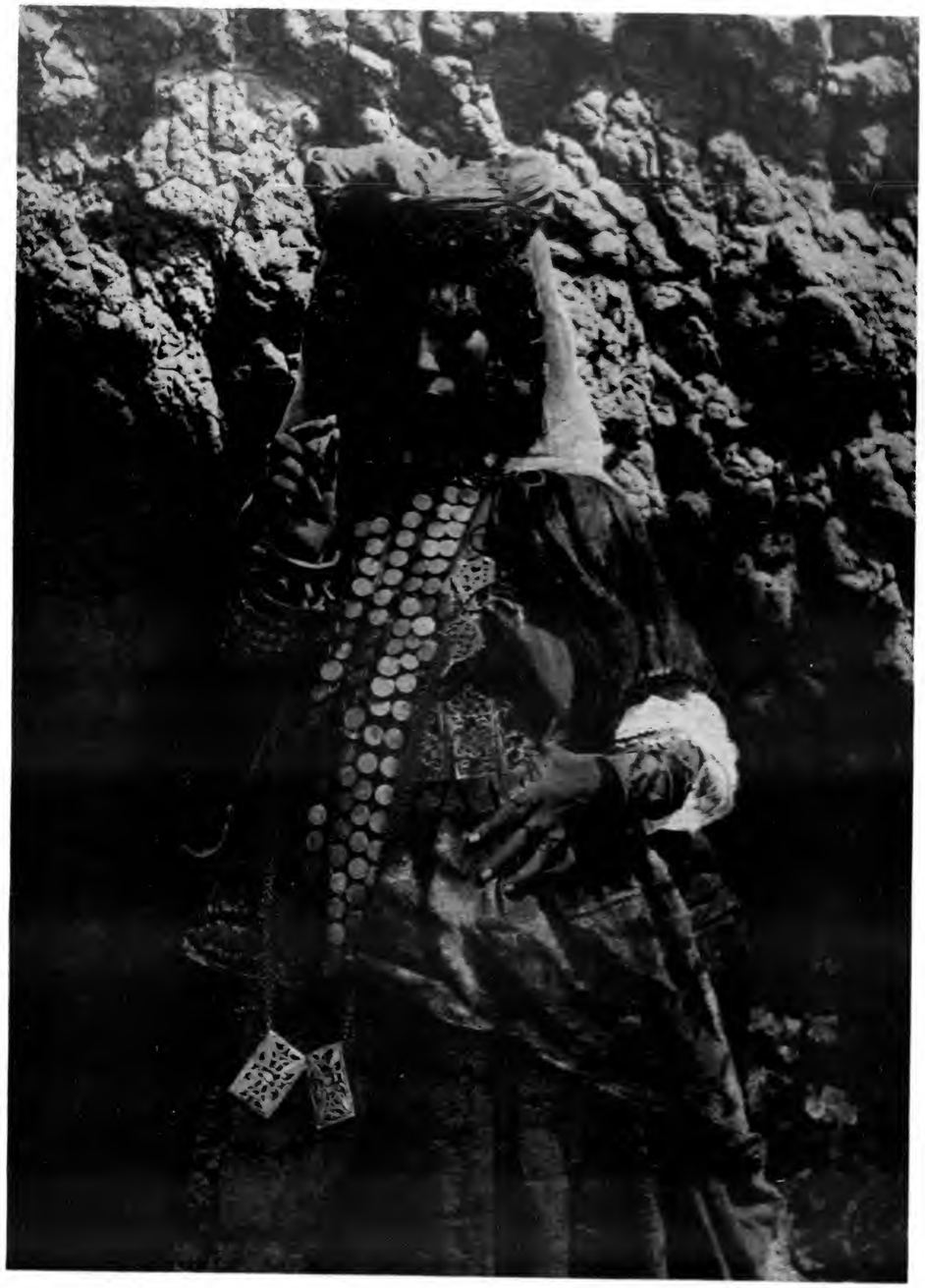


"AN ARAB SHOD WITH FIRE"

She is a dancer of Algeria and the slow, throbbing music of the Orient is just as necessary for her happiness as the jewels and coins with which she adorns herself.

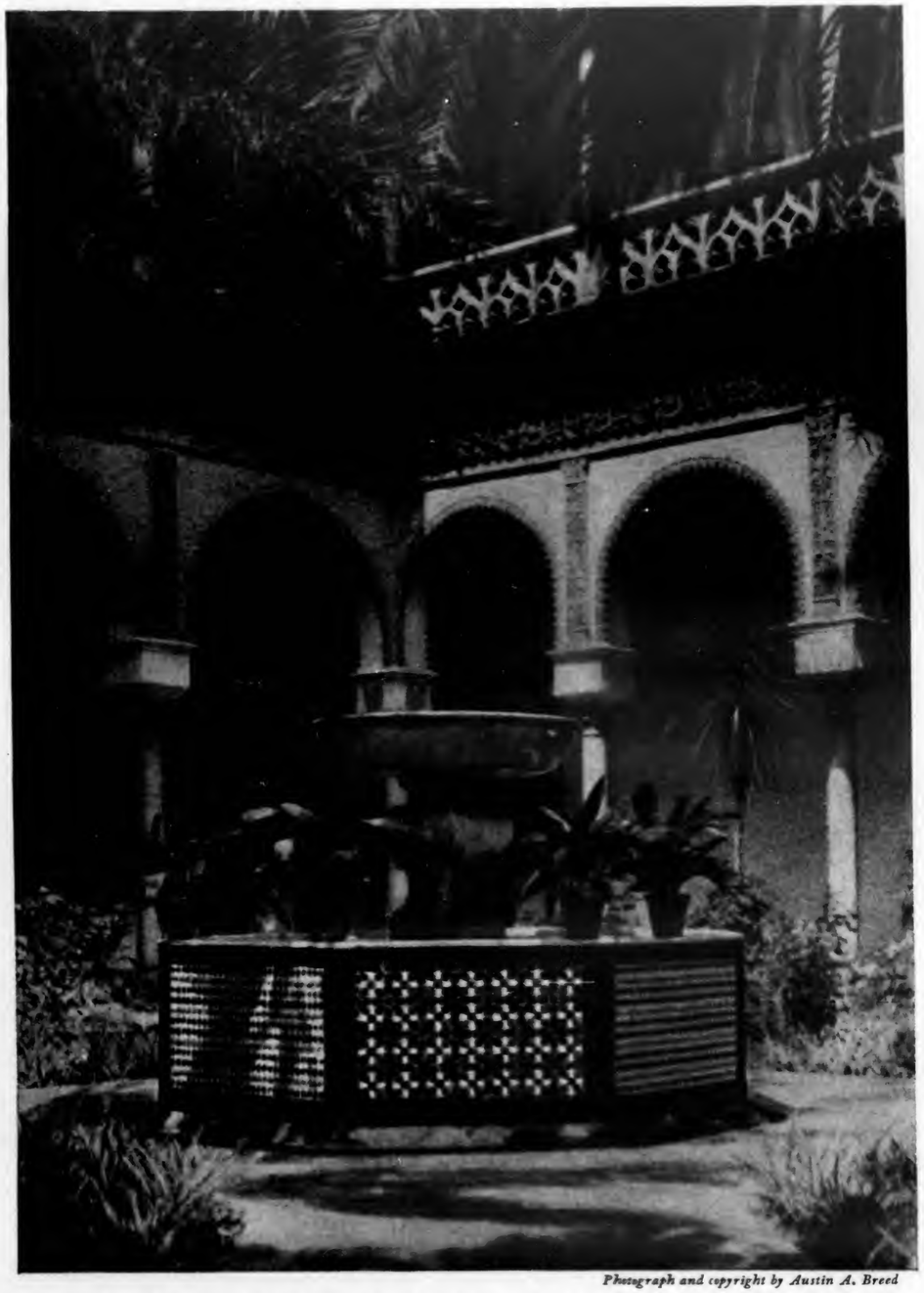
Photograph and copyright by Austin A. Breed

SPANISH GYPSY GIRLS

Picturesque in their rags, the girls and women "tell fortunes," and to those who refuse to have their fortune told is flung this quaint curse: "May you be made to carry the mail and have sore feet."

AN ARAB SHOD WITH FIRE

SPANISH GYPSY GIRLS



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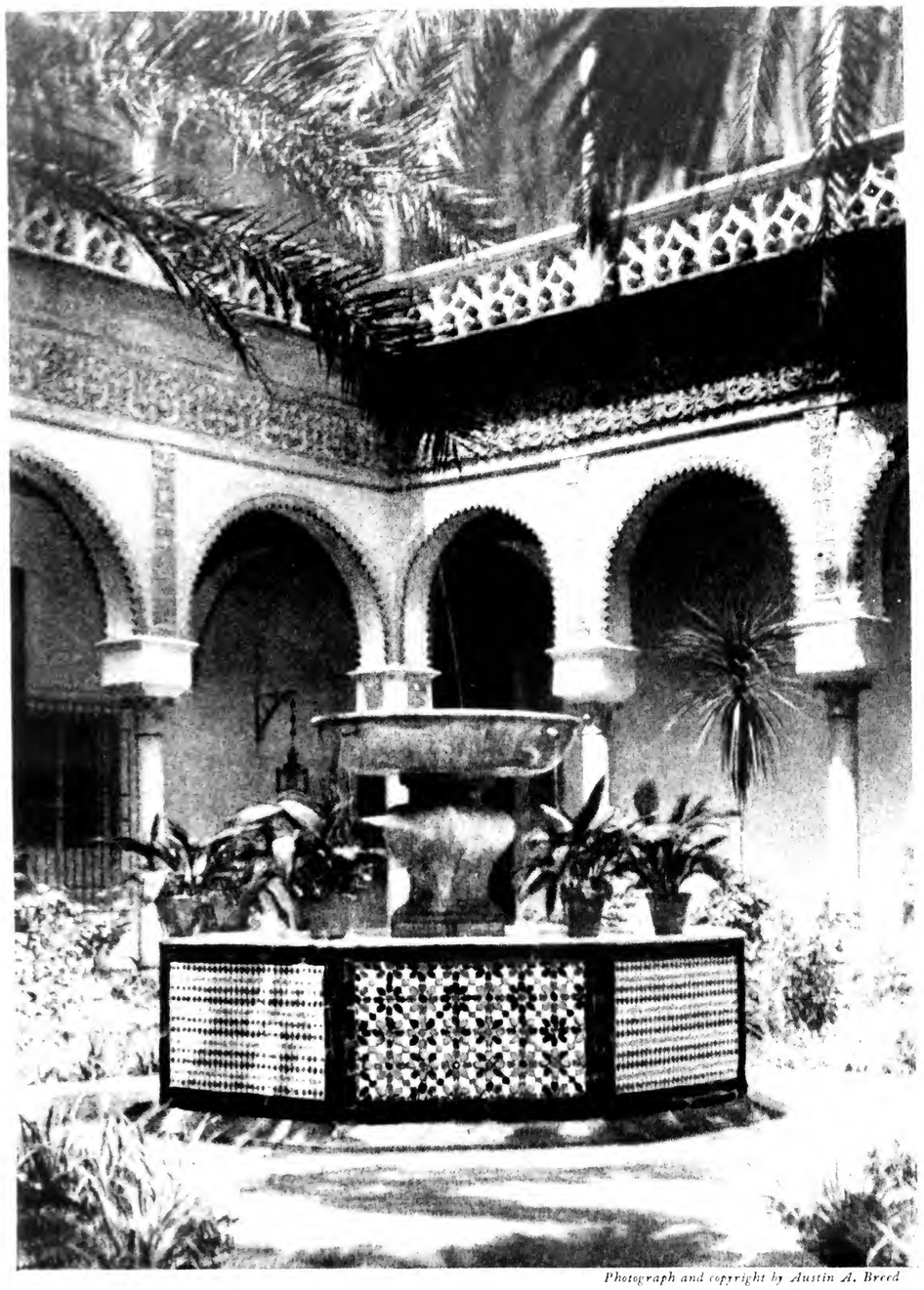
THE PATIO IN THE HOUSE OF THE DUKE OF ALBA, SEVILLE, SPAIN

A fitting companion of the beautiful Alcazar, Seville's rival of Granada's splendid Alhambra in beauty and in historical renown, is the magnificent palace of the Dukes of Alba. Dating from the fifteenth century, this palace, in its architecture, combines the soft lines of Moorish ideals and the sharp ones of Gothic conceptions, and is a fine example of the blending of the two

A DANCER OF THE CAFÉS, ALGERIA

Their faces clouded with a dark paint to increase the natural effect of the desert sun on their skin, their nails darkened with henna, and their cheeks faintly tattooed in blue to show their caste, these beauties of the Ouled Naïl tribe furnish much local color in the crowded cafés of Northern Africa. Their costumes are gorgeous and their heavy ornaments are largely of gold and silver coins.



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FROM THE THRONE ROOM OF THE MOORS

One of the embrasures, or window alcoves, of the Hall of the Ambassadors in the Alhambra at Granada, Spain. In this room met the last assembly of the Moors, summoned by Boabdil to consider the surrender of Granada to the Spanish King Ferdinand just before Columbus discovered America. The visitor is impressed with the fact that the depiction of living things is avoided in Moorish architecture and that the decoration is accomplished with geometrical designs which are astonishingly beautiful.

A BEDOUIN BEAUTY.

"Around her shone
The nameless charms unmarked by her alone,
The light of love, the purity of grace."—*Byron.*

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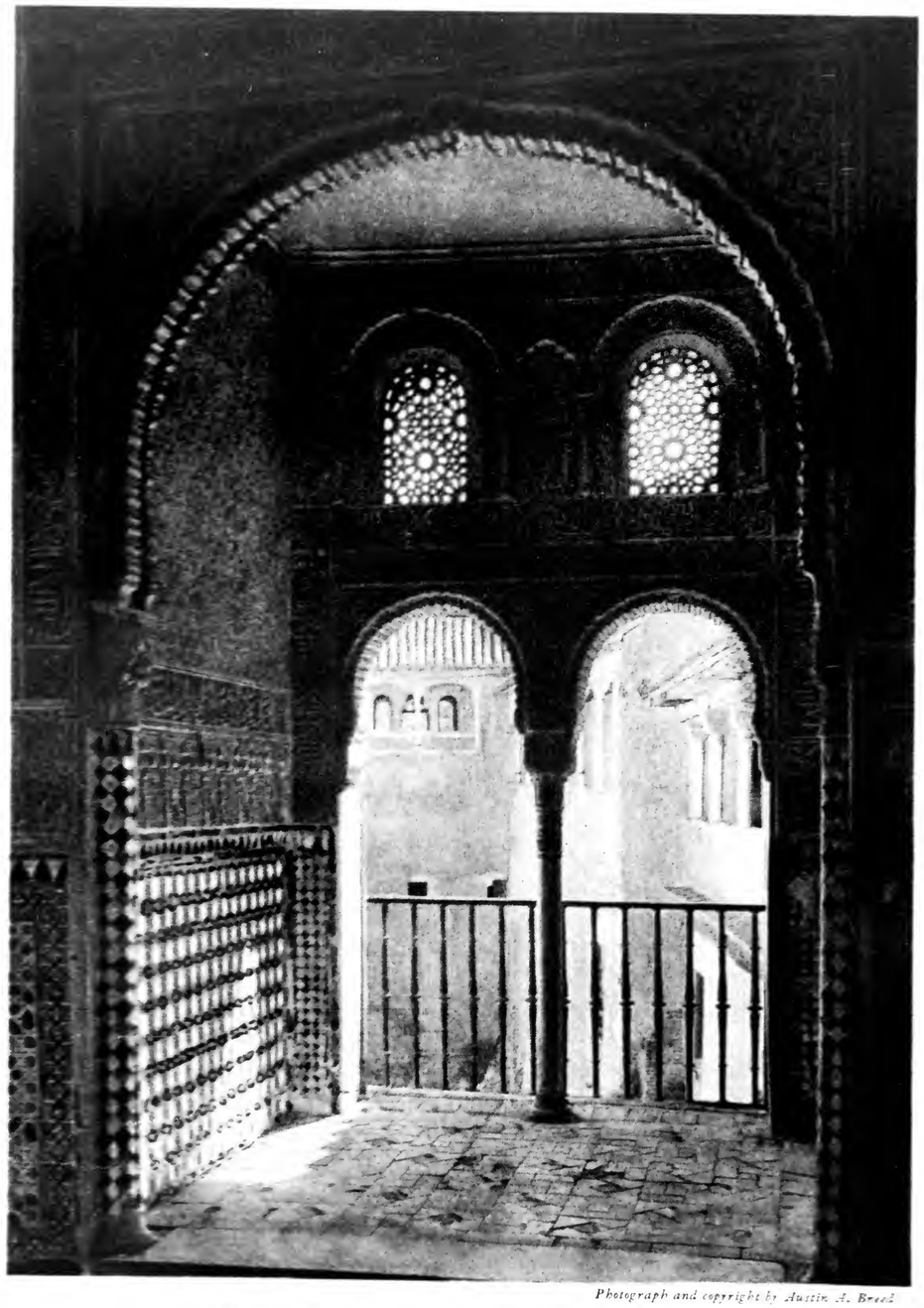

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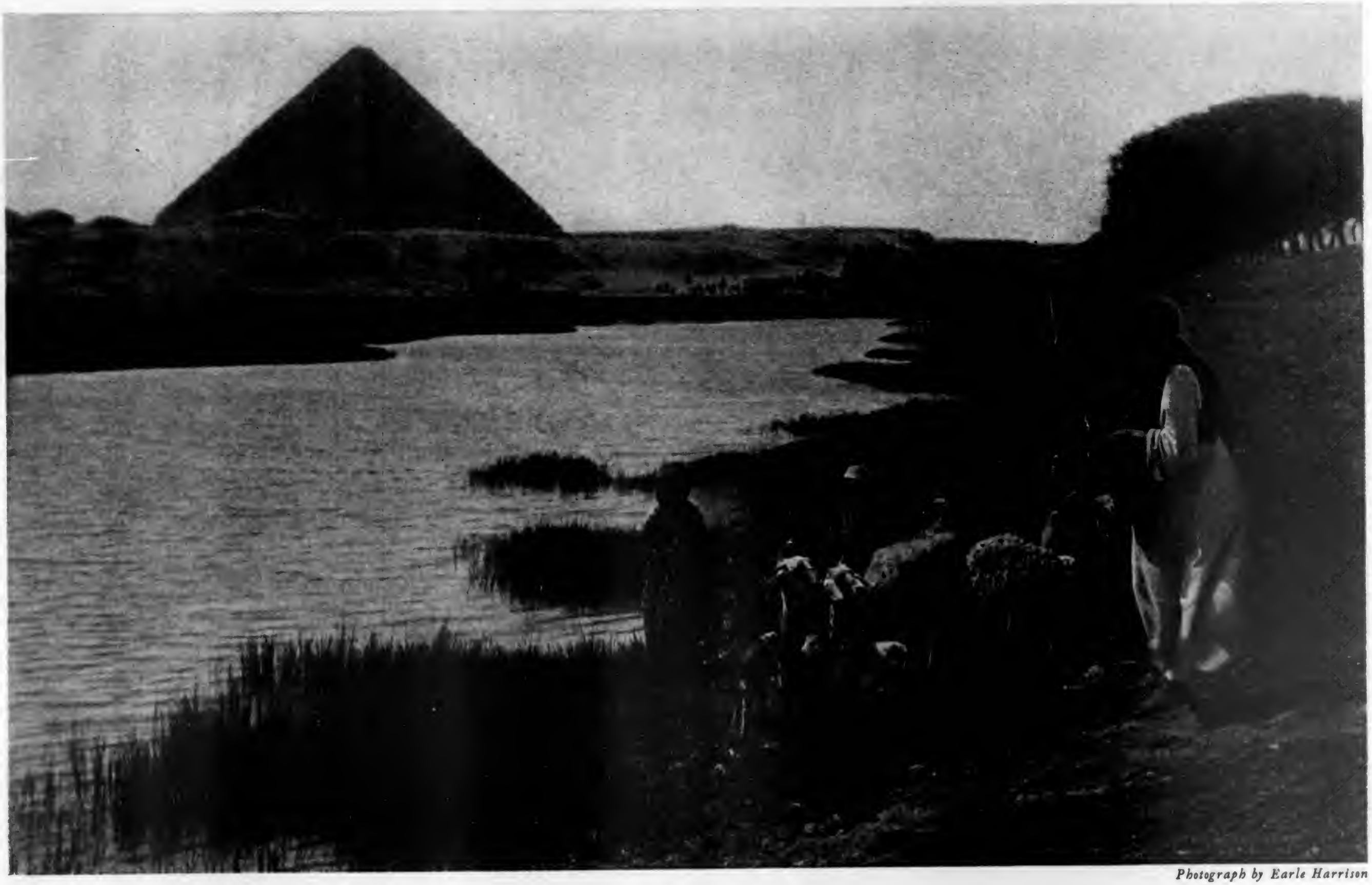

Photograph by Earle Harrison

THE LURE OF MOTHER EGYPT

In addition to the romance and mystery of Egypt's mighty past, expressed on every hand by her crumbling monuments and age-old customs, there is the elusive charm of the East and the soft coloring in pastel shades at eventide which give to the Occidental visitor a never-to-be-forgotten impression of the Land of the Nile.

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A Vital Social and Racial Problem

THE NEGRO IN WASHINGTON

A STUDY IN RACE AMALGAMATION

By A. H. Shannon, B. D. and M. A.

Member American Anthropological Association

Formerly Chaplain Mississippi State Penitentiary

Conditions in Washington City are carefully studied and made the basis for an understanding of the Negro Problem throughout the United States. Racial Intermixture and Illegitimacy in other countries are given when these are of value in illustrating conditions and tendencies existing in the United States and in emphasizing the need for bringing to bear upon amalgamation here the character and the intelligence of both races. The book is not radical except as a plain statement of facts may be so considered. It treats the moral and the ethical features of the Negro Problem with a definiteness achieved by few writers.

"The Negro in Washington: a Study in Race Amalgamation." The following synopsis of chapters will indicate for you the scope of the study.

CHAPTER I

A Statement of the Case. Gives latest and authorative statistics concerning racial intermixture, with a statement of factors promoting miscegenation. Each 20 year period now sees the number of mixed-bloods doubled, thus duplicating the results in racial intermixture of the preceding time the races had been in contact.

CHAPTER II

The Mulatto. A study of the case of the Mulatto and his influence upon the full-blood Negro. The Mulatto now dominates in the various interests of the Negro race. How does life appear to the man situated as is the Mulatto in the United States?

CHAPTER III

Illegitimacy. As high as 27 per cent of the Negro children born in the District of Columbia have been reported as illegitimate. The latest official report returns 16.5 per cent as illegitimate. This chapter discusses Negro family life as of 1930.

CHAPTER IV

Isabella and Jamestown. A contrasting of Spanish and English colonization and their results. England sent out families; Spain, adventurers, with their women left in Europe. Results may be seen in the racial confusion and general instability prevailing in Latin America.

CHAPTER V

The Near White. A careful study of the situation of those who, through repeated ancestral illegitimacies, are approaching whiteness. It is claimed that 5,000 such are now entering the White race annually. The situation of these is deeply tragical.

CHAPTER VI

The Poor White. A thorough discussion of the depressing influence of Negro competition upon the unskilled White laborer. Conditions in South America and in the Southern States are cited, as well as those existing in Washington City.

CHAPTER VII

Politics and the Race Problem. A condensed review of the political aspects of the race problem, with special reference to the dominance of the Mulatto and its affect upon the full-blood Negro, his standard and his ideals.

CHAPTER VIII

Race and Religion. Of 580 of the most prominent Negro ministers in the United States, 95 were considered full-blood Negroes, while 485 were classed as Mulattoes. Of 9,172 students in colleges and universities, 1,605 were classed as black, and 7,567 as Mulatto. This chapter is of very great importance.

CHAPTER IX

Colonization. Many thoughtful people believe. with de Toqueville, that the races must either wholly separate or wholly mingle. Colonization is yet possible. This chapter deals with the various problems involved in colonization.

CHAPTER X

Some Conclusions and a Forward Look. This chapter sums up and correlates the facts brought out in the preceding chapters and seeks to reach the logical and constructive conclusions suggested by these facts. The book is essentially an appeal to the better elements in each race to foster racial self respect, and to the Negro to work out his racial destiny within his own race rather than to seek, through amalgamation at the expense of morality, to escape his race. The possibility of service to his race in Africa depends upon the preservation of his racial integrity in America.

The book contains 332 pages.

A FEW PRESS COMMENTS

"This study is not confined to Washington. Rather by virtue of the compact character of that area, the proportion of its Negro population, the accessibility of facts bearing upon the subject, the Capital is made use of as a standard of comparison and measurement. The work itself covers, in effect, the whole western continent. The purpose of the study is that of gospel, the gospel of race purity. The angle of approach is the Negro himself, his advance, his destiny not—vehemently not—to be attained through a blend of Negro and Caucasian blood. Rather is it to be secured through an intensive cultivation of his exclusively racial traits." —The Star, Washington, D. C., April 27, 1930.

"The volume is replete with tables showing results of years of research among Negroes of the Capital."—The Times, Buffalo, N. Y., May 25, 1930.

"An appalling lack of knowledge regarding the real facts of the Negro-White situation in America leads Mr. Shannon, long a student of race amalgamation, to offer this discussion of the Negro in Washington, one of the most fruitful fields in the country for such an investigation."—Free Press,, Detroit, May 25, 1930.

"The main feature of this investigation is the intermixture of the two races with evaluation of the forces promoting amalgamation" . . . . . "Competition of white and Negro labor results in an increase of 'poor whites' and consequent degeneration."—The Times, Hartford, Conn., May 24, 1930.

"While the study is projected in support of a theory, it contains a notable body of information that is wide in scope, specific in point, accurate in general substance and most certainly applicable to a theme which cannot be held as negligible."—The Star, Washington, D. C., April 27, 1930.

"Shannon's 'The Negro in Washington' is an intensely earnest book. The problem discussed has occupied the author's attention for many years and this is the fourth time he has written upon it. Though the study is made of the Negro in the City of Washington, the problem and the argument would be the same in any part of the country."—Dr. Frederick Starr, Professor Emeritus in Anthropology, University of Chicago, in Unity, September 14, 1931.

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per patient from the province, and $1.75 daily per patient from the municipality. The total general hospital revenue last year was $10,140,782. The commission emphasized the need of a government owned psychiatric hospital and to assist institutional schools in caring for Ontario's 6,000 crippled children, 2,000 blind and 3,000 deaf and dumb persons, recommended the division of the province into ten districts, in each of which will be stationed a graduate nurse or social worker supervised by a special government officer. It was recommended that the raising of funds to effect other recommendations of the commission should be patterned after the Quebec plan, in which more than $600,000 is raised annually by a hospital tax of 5 per cent. of the cost of all meals over $1, levied in hotels and restaurants. Among the recommendations was one which advised that a special conference of medical men be convened to study cancer treatment and that the province establish a cancer hospital and purchase a supply of radium. Emphasis was laid on the need of preventive clinics, provisions for occupational training for convalescents, and aid in the rehabilitation of tuberculosis patients on discharge.

ACCORDING to *Nature*, with the cooperation of the authorities of various national museums, the British Museums Association organized a short training course for curators during the week of October 6–11. The course was attended by thirty-three students from provincial museums, for the most part junior assistants, though a few seniors were glad to avail themselves of this opportunity. The gathering was welcomed in the new Conference Hall at the Science Museum by Sir Henry Lyons, when an opening address on first principles of museum work was given by Dr. F. A. Bather, and Dr. E. E. Lowe discussed some fundamental points in museum practice. Succeeding days were devoted to the Victoria and Albert Museum, with demonstrations on textiles, wood furniture, ceramics, prints and the circulation department; the Natural History Museum, with demonstrations on habitat groups, casting of whales, preparing spirit specimens, and preparation of fossils for exhibition; the National Galleries in Trafalgar Square and at Millbank, with talks on storage, cataloguing and the explanation of pictures; the laboratory of the British Museum, with a lecture on restoration of Egyptian relics.

DISCUSSION

SOME CRITICISMS OF "RACE CROSSING IN JAMAICA"

IN SCIENCE, No. 1850, Castle criticizes Jennings and me for certain conclusions drawn by Steggerda and me in "Race Crossing in Jamaica" (1928) and utilized by Jennings in his book "The Biological Basis of Human Behavior." The vigor of Castle's criticism reminds me of a boyhood experience, when absorbed in watching a procession. A woman next to me let out a shriek, crying, "You are stepping on my corns." Castle has two well-developed scientific corns: one, that size factors in mammals are general factors affecting all parts of the skeleton simultaneously (Castle, 1914); the other, that no disharmony results from race crossing.

The first corn is irritated by the finding of Steggerda and me (1929) that blacks have longer legs than whites, both absolutely and relatively to stature. Castle had previously[1] criticized me for finding a difference in leg length between Negro and Amerind. While in our Table 67 the difference in absolute leg length between blacks and whites is not much greater than the probable error of the means, the differences in relative leg length amount to 2 per cent., which strikes us as considerable, as anthropometric differences go. Also, the superiority of blacks in length of the leg and its segments is shown in all the other germane tables, namely, relative kneeling height, stature minus kneeling height and tibiale height (length of lower leg + foot). The difference between blacks and whites in these tables is consistent and in some cases considerable. The differences in absolute length of lower leg is 5 times the probable error.

That the proportions of trunk to leg do differ in different races of mankind is indisputable. If Castle will refer to Martin's "Lehrbuch der Anthropologie," 2d Aufl., pp. 411 and 412, he will find conclusive evidence of this. From his tables Martin draws the conclusion: "The relative leg-length of Negroes, Veddahs, some East Indians and Australians is especially large."

That Castle apparently still maintains his old position, though with some shifts (Castle, 1924, p. 20), is the more remarkable in view of the keen analysis of Wright (1918), who shows that in Castle's rabbits bone lengths vary to a certain extent independently. Also there are groups of bones that vary together and independently of the rest of the body. "Again," says Wright, "the bones of the hind leg (femur and tibia) form a group subject to common influences which do not affect the humerus, a bone of the fore leg."

The second irritating conclusion of mine is that in individual browns there occurs a deviation from the average proportions of leg length to arm length that is found in the parent races, white and black. Castle doubts if such a disharmony is possible. Not all the

[1] In Publication No. 320 of the Carnegie Institution.

evidence for our conclusion can be given here. It lies, in part, in the great range of dimensions of the arm and leg lengths in the browns as compared with either whites or blacks alone as shown in Tables 43 to 46, 48, 49, 52 to 54, 66 to 68, 72. That despite the usual large range the standard deviation of the browns is not always the highest of the three racial groups is probably due to the fact that the browns are the most rigidly selected of all, about half being students at Mico College.

That species hybrids can form highly variable zygotes including those that die in embryo or at a later developmental stage is well known among plants[2] in both first and especially second hybrid generations. If species hybrids, often apparently through the presence of genes with conflicting tendency, die, there is nothing extraordinary in the finding that in a less extreme cross viable but not fully harmonious progeny may be produced in F_x. That disharmonious instincts appear is easily demonstrated in dogs and poultry. That morphological disharmonies appear is well illustrated by Bryn's findings on the easily dislocated hips of Norwegian-Lapp hybrids, and the still unpublished findings of Stockard with dog hybrids.

The capacity of the organism through self-adjustment to make good some gene deficiencies is no doubt very great. But it has its limits. I have myself seen one of twins who, at birth, lacked even bilateral symmetry of the legs.

Finally, a word of protest against some misrepresenting phrases that Castle (no doubt unwittingly) has introduced into the discussion. He says, "Perhaps it is leg length in relation to total stature that puts browns at a physical disadvantage in relation to whites and blacks." This certainly distorts our conclusion. We never stated that "browns" were at a physical disadvantage; we stated precisely "some of the hybrids." We certainly never drew the conclusion that the Negro-white cross is inferior to the Negro or the whites; but we did find some cases of browns that seemed to present greater extremes—and sometimes less well-adjusted extremes—than either of the parental races. Our conclusion is not as Castle suggests it is, that the browns "are a degradation of the white race." Our conclusion is given at p. 477: "While, on the average, the Browns are intermediate in proportions and mental capacities between Whites and Blacks, and although some of the Browns are equal to the best of the Blacks in one or more traits still among the Browns there appear to be an excessive per cent. over random expectation who seem not to be able to utilize their native endowment."

[2] See Renner, in "Handbuch der Vererbungswiss.," Bd. II.

In *Nature*, No. 3177, Professor Karl Pearson publishes a critical review of "Race Crossing in Jamaica." His main complaints are based on the fact that the samples are insufficient—the adults of the 6 groups running from 50 to 93 per group. There is nothing to be said on this point except that funds and time were limited and the numbers of adults cited are all that we could, under the circumstances, secure. Whether results based on such small numbers were worth publishing is a question on which different opinions may be held. The committee thought they were worth publishing. The uniform computation of probable errors was relied upon to indicate the limits of significance (or insignificance) of the numerical results.

In regard to another matter about which Pearson complains, *viz.*, homogeneity of material, this is discussed from page 5 to 19; also pages 20 and 22. We do not recall any work of this nature where the homogeneity of the material is discussed more fully. Certainly we had in mind the desirability of genetical purity of the blacks, and think that we have eliminated the hybrids nearly as successfully as we could have done it for the "West African Negroes" to whom Pearson refers, mixed as they have been from time immemorial with Arabians and Jewish traders. If 2 or 5 per cent. of errors were made it would not have changed, we think, the essential conclusions of the work. The whites certainly included no "pass-for-whites," as they were taken from very segregated white populations.

C. B. DAVENPORT

CARNEGIE INSTITUTION OF WASHINGTON

INDUCED PARTHENOGENESIS AND HOMOZYGOSIS

THE report of the production of homozygotes through induced parthenogenesis in Nicotiana and Fragaria, by Dr. East,[1] may justify a short review of parthenogenesis in the grouse locusts (Tettigidae). During attempts, 1915–18, to cross males and females of *Paratettix texanus* with those, respectively, of *Apotettix eurycephalus*, it was observed that the comparatively few resulting offspring were homozygous for the dominant segregate, or cross-over color patterns of the females, were themselves females and showed no trace of the dominant characteristics of the males. It was at first thought and noted that perhaps the development of the eggs had been in some way induced, or initiated, by the males of the opposite species, or by their products. However, before publication[2] it had been ascertained that the parthenogenesis

[1] SCIENCE, August 8, 1930.
[2] *Amer. Nat.*, 53: 131–142, 1919.

COMPARATIVE VOCABULARY.

(REPRINTED FROM SMITHSONIAN INSTRUCTIONS IN ETHNOLOGY AND PHILOLOGY.)

COUNTRY,.....

TRIBE,.....

RECORDED BY.....

DATE OF RECORD,.....

WASHINGTON:
SMITHSONIAN INSTITUTION.
MAY, 1863.

COMPARATIVE VOCABULARY.

	ENGLISH.	SPANISH.	FRENCH.	LATIN.
	Name of the tribe.	Nombre de la tribu.	Nom de la tribu.	Nomen nationis.
1	man	hombre	homme	vir—homo
2	woman	mujer	femme	mulier
3	boy	muchacho	garçon	puer
4	girl	muchacha	fille	puella
5	infant	niño ó niña	enfant	infans
6	my father (said by son)	mi padre, dice el hijo	mon père dit le fils	pater meus, dicit filius
7	my father (said by daughter)	" " dice la hija	" " d't la fille	" " " filia
8	my mother (said by son)	mi madre, dice el hijo	ma mère dit le fils	mater mea, dicit filius
9	my mother (said by daughter)	" " dice la hija	" " dit la fille	" " " filia
10	my husband	mi marido	mon mari	sponsus meus
11	my wife	mi esposa	mon épouse	uxor mea
12	my son (said by father)	mi hijo, dice el padre	mon fils, dit le père	filius meus, dicit pater
13	my son (said by mother)	mi hijo, dice la madre	mon fils, dit la mère	filius meus, dicit mater
14	my daughter (said by father)	mi hija, dice el padre	ma fille, dit le père	filia mea, dicit pater
15	my daughter (said by mother)	mi hija, dice la madre	ma fille, dit la mère	filia mea, dicit mater
16	my elder brother	mi hermano mayor	mon frère ainé	frater meus natu major
17	my younger brother	mi hermano menor	mon frère cadet	frater meus natu minor
18	my elder sister	mi hermana mayor	ma sœur ainée	soror mea natu major
19	my younger sister	mi hermana menor	ma sœur cadette	soror mea natu minor
20	an Indian	Indio	sauvage	Indus
21	people	gente	peuple	populus

	ENGLISH.	SPANISH.	FRENCH.	LATIN.
22	head	cabeza	tête	caput
23	hair	pelo	cheveux	crinis
24	face	cara	figure	facies
25	forehead	frente	front	frons
26	ear	oreja	oreille	auris
27	eye	ojo	œil	oculus
28	nose	nariz	nez	nasus
29	mouth	boca	bouche	os
30	tongue	lengua	langue	lingua
31	teeth	dientes	dents	dentes
32	beard	barba	barbe	barba
33	neck	cuello	cou	collis
34	arm	brazo	bras	brachium
35	hand	mano	main	manus
36	fingers	dedos	doigts	digiti
37	thumb	dedo pulgar	pouce	digitus pollex
38	nails	uñas	ongles	ungues
39	body	cuerpo	corps	corpus
40	chest	pecho	poitrine	sternum
41	belly	barriga	ventre	venter
42	female breasts	pechos de mujer	mamelles	ubera
43	leg	pierna	jambe	crus
44	foot	pié	pied	pes
45	toes	dedos del pié	doigts du pied	digiti pedis
46	bone	hueso	os	os
47	heart	corazon	cœur	cor

	ENGLISH.	SPANISH.	FRENCH.	LATIN.
48	**blood**	sangre	sang	sanguis
49	**town, village**	pueblo, villa, aldea	bourg, village	oppidum, pagus
50	**chief**	jefe	capitaine	dux
51	**warrior**	guerrero	guerrier	miles
52	**friend**	amigo	ami	amicus
53	**house**	casa	maison	domus
54	**skin lodge**	casa de cueros	loge de peaux	tentorium e pellibus
55	**kettle**	caldera	chaudière	lebes
56	**bow**	arco	arc	arcus
57	**arrow**	flecha	flèche	sagitta
58	**axe, hatchet**	hacha	hache	ascia
59	**knife**	cuchillo	couteau	culter
60	**canoe**	canoa	canot	scapha Indica
61	**moccasins**	zapatos Indios	souliers de sauvage	calceamenta Indica
62	**pipe**	pipa	pipe	tubus nicotianus
63	**tobacco**	tabaco	tabac	nicotianum
64	**sky**	cielo	ciel	cœlum
65	**sun**	sol	sol	sol
66	**moon**	luna	lune	luna
67	**star**	estrella	étoile	stella
68	**day**	dia	jour	dies
69	**night**	noche	nuit	nox
70	**morning**	mañana	matin	tempus matutinum
71	**evening**	tarde	soir	vesper
72	**spring**	primavera	printemps	ver
73	**summer**	verano	été	æstas

	ENGLISH	SPANISH.	FRENCH.	LATIN.
74	autumn	otoño	automne	autumnus
75	winter	invierno	hiver	hibernus
76	wind	viento	vent	ventus
77	thunder	trueno	tonnerre	tonitru
78	lightning	relámpago	éclair	fulgur
79	rain	lluvia	pluie	pluvium
80	snow	nieve	neige	nix
81	fire	fuego	feu	ignis
82	water	agua	eau	aqua
83	ice	hielo	glace	glacies
84	earth, land	tierra	terre	terra
85	sea	mar	mer	mar
86	river	rio	fleuve, rivière	flumen
87	lake	lago	lac	lacus
88	valley	valle	vallée	vallis
89	prairie	llano	prairie	pratum
90	hill, mountain	cerro, montaña	côte, montagne	collis, mons
91	island	isla	île	insula
92	stone, rock	piedra, roca	pierre, roche	lapis, saxum
93	salt	sal	sel	sal
94	iron	hierro	fer	ferrum
95	forest	bosque, selva	forêt	sylva
96	tree	árbol	arbre	arbor
97	wood	madera	bois	lignum
98	leaf	hoja	feuille	folium
99	bark	corteza	écorce	cortex

	ENGLISH.	SPANISH.	FRENCH.	LATIN.
100	grass	yerba	herbe	herba
101	pine	pino	pin	pinus
102	maize	mais	maïs	zea maiz
103	squash	calabaza	citrouille	cucurbitus
104	flesh, meat	carne	chair	caro
105	dog	perro	chien	canis
106	buffalo	bisonte, búfalo	buffle	bison, bos americanus
107	bear	oso	ours	ursus
108	wolf	lobo	loup	lupus
109	fox	zorra	renard	vulpis
110	deer	ciervo	cerf	cervus
111	elk	alco	élan	cervus canadensis
112	beaver	castor	castor	castor
113	rabbit, hare	conejo	lapin, lièvre	lepus
114	tortoise	tortuga	tortue	testudo
115	horse	caballo	cheval	equus
116	fly	mosca	mouche	musca
117	mosquito	mosquito	maringouin	culex
118	snake	culebra, serpiente	serpent	serpens
119	rattlesnake	culebra de cascabel	serpent à sonnettes	crotalus
120	bird	ave	oiseau	avis
121	egg	huevo	œuf	ovum
122	feathers	plumas	plumes	plumæ
123	wings	alas	ailes	alæ
124	goose	ganso	oie	anser
125	duck (mallard)	pato	canard	anas boschas

	ENGLISH.	SPANISH.	FRENCH.	LATIN.
126	turkey	pavo, guanajo	dindon	pavo
127	pigeon	pichon	tourte	columba
128	fish	pez	poisson	piscis
129	salmon	salmon	saumon	salmo
130	sturgeon	esturion	esturgeon	sturio
131	name	nombre	nom	nomen
132	white	blanco	blanc	albus
133	black	negro	noir	niger
134	red	colorado	rouge	rubrum
135	light blue	azul celeste	bleu	cœruleum
136	yellow	amarillo	jaune	amarillis
137	light green	verde	vert	viridis
138	great, large	grande	grand	magnus
139	small, little	pequeño	petit	parvus
140	strong	fuerte	fort	fortis
141	old	viejo	vieux	vetus
142	young	joven	jeune	juvenis
143	good	bueno	bon	bonus
144	bad	malo	mauvais	malus
145	dead	muerto	mort	mortuus
146	alive	vivo	vivant	vivus
147	cold	frio	froid	frigidus
148	warm, hot	caliente	chaud	calidus
149	I	yo	je	ego
150	thou	tú	tu	tu
151	he	él	il	ille

	ENGLISH.	SPANISH.	FRENCH.	LATIN.
152	we	nosotros	nous	nos
153	ye	vosotros	vous	vos
154	they	ellos	ils	illi
155	this	este	ceci	iste
156	that	aquel	cela	ille
157	all	todo, todos	tout, tous	omnis, totus
158	many, much	mucho, muchos	beaucoup	multus
159	who	quien	qui	qui
160	far	lejos	loin	longe
161	near	cerca de	près	prope
162	here	aqui	ici	hic
163	there	allá	là	illuc
164	to-day	hoy	aujourd'hui	hodie
165	yesterday	ayer	hier	heri
166	to-morrow	mañana (el dia de)	demain	cras
167	yes	sí	oui	ita
168	no	no	non	minime
169	one	uno	un	unus
170	two	dos	deux	duo
171	three	tres	trois	tres
172	four	cuatro	quatre	quatuor
173	five	cinco	cinq	quinque
174	six	seis	six	sex
175	seven	siete	sept	septem
176	eight	ocho	huit	octo
177	nine	nueve	neuf	novem

	ENGLISH.	SPANISH.	FRENCH.	LATIN.
178	ten	diez	dix	decem
179	eleven	once	onze	undecim
180	twelve	doce	douze	duodecim
181	twenty	veinte	vingt	viginti
182	thirty	treinta	trente	triginta
183	forty	cuarenta	quarante	quadraginta
184	fifty	cincuenta	cinquante	quinquaginta
185	sixty	sesenta	soixante	sexaginta
186	seventy	setenta	soixante-dix	septuaginta
187	eighty	ochenta	quatre-vingts	octoginta
188	ninety	noventa	quatre-vingt-dix	nonaginta
189	one hundred	ciento	cent	centum
190	one thousand	mil	mille	mille
191	to eat	comer	manger	edere
192	to drink	beber	boire	bibere
193	to run	correr	courir	currere
194	to dance	bailar	danser	saltare
195	to sing	cantar	chanter	cantare
196	to sleep	dormir	dormir	dormire
197	to speak	hablar	parler	loqui
198	to see	ver	voir	videre
199	to love	amar	aimer	amare
200	to kill	matar	tuer	cædere
201	to sit	sentarse	s'asseoir	sedere
202	to stand	estar en pie, parar	se tenir debout	stare
203	to go	ir	aller	ire

	ENGLISH.	SPANISH.	FRENCH.	LATIN.
204	to come	venir	venir	venire
205	to walk	andar	marcher	ambulare
206	to work	trabajar	travailler	operari
207	to steal	robar	voler	furare
208	to lie	mentir	mentir	mentiri
209	to give	dar	donner	dare
210	to laugh	reir	rire	ridere
211	to cry	gritar	crier	clamare

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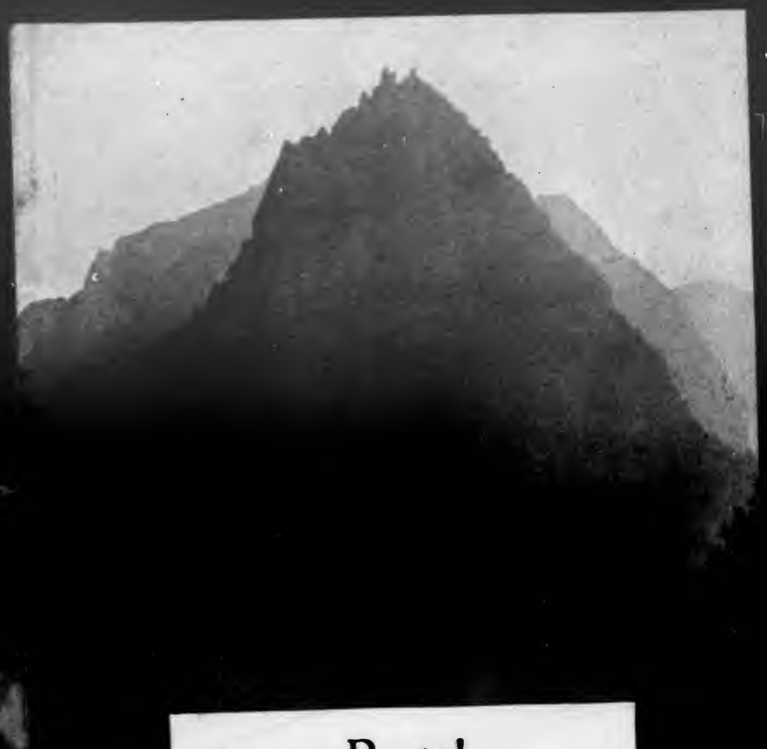

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R6-22 THE MYSTERY OF THE DESERT

NATIVE SPEARING FISH IN HAWAII

Wonders of the Insect World

ILLUSTRATED by scores of color and other beautiful and scientifically accurate illustrations of butterflies, beetles, wasps, and other insects, this exquisite number will be a compelling guide to insect life for child, adult, teacher, or naturalist. Using simple narrative English and omitting technical terms, it admits the reader to the wonderland revealed through years of observation by eminent investigators of this fascinating world.

Into its easily understood pages have been condensed astonishing, enlightening facts gathered in thorough, intensive study of some 500 volumes and thousands of scientific pamphlets.

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WASHINGTON, D. C.

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Linguistics 1891-1933

C. Hart Merriam
Papers
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OUTLINES OF LINGUISTIC SCIENCE.[1]—In what has appeared of the second volume of his "outline of linguistic science," the celebrated Austrian linguist has given to the world a series of short, but lucid sketches of the languages of Eastern Siberia, not belonging to the Ural-Altaic family; of Ale-ut, Eskimo and also of the whole Malay-Polynesian family scattered over the whole Pacific ocean. The languages of Western and Southern Africa was disposed of in the first volume, and in one of the next numbers the author will reach the American languages.

[1] *Dr. Friedr. Müller, Grundriss der Sprachwissenschaft.* Vol. II, No. 1ª. 2ª. Wien. 1880. 8°. A. Flölder, publisher.

Am. Nat. Vol XV, No 2, 131, Feb. 1881.

Vocabulary from Honduras

573

Hondureñismos. Vocabulario de los provincialismos de Honduras. Por ALBERTO MEMBREÑO. Secunda edicion corregida y aumentada. Tegucigalpa: 1897. 8°, xiv, 269 pp.

The limited acquaintance which those of the outside world have of Honduras, its history, culture, and languages, makes acceptable any contribution that is likely to render knowledge concerning its interesting and diversified population. Among the two thousand words gathered by Dr Membreño in the above-titled work, there are found Spanish terms used with significations differing from those of classic Spanish; others are of Indian, especially Nahuatl, origin, or dialectal terms now of unknown derivation. The author often illustrates the meanings of peculiar words by presenting sentences in which they occur; and from the number of collaborators mentioned it is apparent that the people of Honduras are taking deep interest in researches of this description. The appendix to the volume is devoted to vocabularies, each of 250 to 400 terms, of the following Indian stock languages spoken within the confines of the republic: Moreno or Carib, Zambo or Misskito, Sumo or Woolwa, Paya, Jicaque, Lenco, and Chorti. While Chorti belongs to the Maya family, Carib originally was South American and West Indian; and Zambo, better known to Americans as Misskito, has its principal domain in eastern Nicaragua. Of the Paya no vocabulary had ever been printed prior to the present work consequently Membreño's publication, so far at least as Indian linguistics are concerned, comes as a highly agreeable surprise.

A. S. GATSCHET

Am. Anthropologist, Vol. 1, No. 3, July 1899

Am. Anthropologist, Vol. 30, No. 3.
July-Sept. 1928

For the entire kingdom the frequency of the Purer Nordic type is 30.8 percent, of the Purer East Baltic type 8.7 percent, of the light mixed type (individuals with light eyes and light head hair other than Purer Nordic and Purer East Baltic) 27.1 percent. This makes 66.6 of the population light eyed and light-haired (p. 181).

As the editors clearly recognize, the work leaves many problems unsolved, which it is planned to elucidate in the future. It is to be hoped, too, that the individual measurements will be made available.

The enlightened example of the Swedish government in establishing the Swedish State Institute for Race Biology is one which other nations would do well to follow. The usefulness of such an institution was so well realized in Sweden that the Riksdag gave assent to its establishment without voting, on May 13, 1921.

Although written in English this splendid work was published in Sweden, being printed by Almquist and Wiksell Printing Company, Limited. It sets a high book-making standard in every respect that a scientific book should and contrasts with the all-too-frequent careless contemporary scientific productions in English-speaking countries.

E. W. GIFFORD

MISCELLANEOUS

In Commemoration of M. A. Castren on the 75th Year from his Death. (Published by the Academy of Sciences, Leningrad, 1927. Pp. 1–141. In Russian.)

The great Finnish linguist, Matthias Alexander Castren, was born in Finland, December 2, 1813, and died May 7, 1852. He did not reach the age of forty by one and a half years. His first article (on the Kalevala) appeared in the "Helsingfors Morgonblad" of December, 1836, and thus the whole cycle of his scientific investigations and writings embraces a period of only sixteen years. It is almost unbelievable to conceive how many journeys he undertook and what a number of investigations he accomplished in such a short time.

He investigated twenty languages, with many dialects, which nobody had studied before him. The monumental series of his chief publications, under the editorship of the Russian academician, A. Schiefner, includes twelve volumes under the title of *Nordische Reisen und Forschungen* as follows:

I. Reiseerinnerungen aus den Jahren 1838–1844.
II. Reiseberichte und Briefe aus den Jahren 1845–1849.

III. Vorlesungen über die Finnische Mythologie.
IV. Ethnologische Vorlesungen über die Altaischen Völkerschaften.
V. Kleinere Schriften.
VI. Versuch einer Ostjakischen Sprachlehre (two editions).
VII. Grammatik der Samojedischen Sprachen.
VIII. Wörterverzeichnisse aus den Samojedischen Sprachen.
IX. Grundzüge einer Tungusischen Sprachlehre.
X. Versuch einer Burjatischen Sprachlehre.
XI. Versuch einer Koibalischen and Karagassischen Sprachlehre.
XII. Versuch einer Jenissei-Ostjakischen and Kottischen Sprachlehre.

The book comprises ten articles by noted Russian linguists, philologists, ethnographers, and anthropologists:

1. Introduction, by S. F. Oldenburg, the Permanent Secretary of the Russian Academy of Sciences.
2. Castren as a Man and Scholar, by W. G. Bogoras.
3. Castren, the Altaiologist and Ethnographer, by L. J. Sternberg.
4. Castren, the Finnologist, by D. W. Bubrich.
5. Castren, the Investigator of the Samoyed, by N. N. Poppe.
6. Castren, the Turkologist, by A. N. Samoilovich.
7. Castren, the Mongologist, by B. J. Vladimirtzev.
8. Castren, the Investigator of the Palae-Asiatics, by W. G. Bogoras.
9. Castren, the Tungusologist, by J. P. Koshkin.
10. Bibliographical Materials, by L. B. Modsalevsky.

Each of these authors gives an impressive characterization of Castren as a man, scholar, traveler, investigator, and writer. Castren was a penetrating thinker. In the determination of sounds of recordless languages he anticipated the methods of the present phonetics. He laid the foundation for the study of the "Mongoloid" languages. He demonstrated the relation of Finno-Samoyedic languages with the languages of the Turks, Mongols, and Tungus. He tried to bridge also the gap between the Mongoloids and Palae-Asiatics (or "Americanoids" in the writer's terminology) through the Yeniseians, and it remained only to extend the connections to the languages of the Eskimo and American Indians, which connections are the object of the most recent studies. In the realm of religion he outran Tylor and Spencer, taking the stand of the latest theories concerning magic, shamanism, and religion. Castren formulated long before MacLennan, and more correctly, the institution of exogamy; and as concerns marriage regulations within the clans of the Siberian natives and between the clans he may be regarded as the predecessor of Morgan.

During his long journeys, combined with many hardships and assiduous studies of natives in their unhealthy huts and tents, the

physical organism of Castren gave way. He contracted consumption. He was aware of it, nevertheless he continued his investigations, saying that the highest joy of a man is to offer his life for an idea. And his idea was the study of primitive human companions. He married, however, about a year before his death and shortly before his death a son was born to him. Pausing here, we wish to say that it would be worth while to translate into English this little book on a great man.

In connection with Castren another great name must be mentioned here, that of the honorary member of the Imperial Russian Academy of Sciences, Professor Anton Schiefner, who, neglecting his own scientific work, devoted many years of his life to the scrupulous working out and preparing for the printer of the material collected by Castren. This he did mostly after Castren's death. There remained, however, some material not worked out as yet.

Castren's first records were written in Finnish but he soon adopted the German language, his style being revised by Schiefner. With the Russian language Castren became familiar in Siberia. The members of the Russian Academy of Sciences of that time were mostly Germans, of Germany or of the Russian Baltic provinces, and the publications of the Academy were mainly printed in German. This had its advantage, the publications being accessible to foreign scholars. Many of the German publications of the Russian Academy of Sciences were later translated into Russian, as for instance, Middendorff's, Schrenck's, Dittmar's, and other papers. When Russian scholars became preponderant, the Russian language was adopted, with casual issues in two languages.

WALDEMAR JOCHELSON

SOME NEW PUBLICATIONS

Amsden, Monroe. Archaeological Reconnaissance in Sonora. (Southwest Mus. Paps., 1: 1–51, 1928.)

Armstrong, W. E. Rossel Island. An Ethnological Study. (Cambridge: The Univ. Press, 1928.)

Batson, O. V. The Anatomy of the Corium. (Science, n.s.,67: 198, 199, 1928.)

Beckwith, Martha Warren. (Collected by) Notes on Jamaican Ethnobotany. (Publ. of Folk-Lore Found., 8: 1–47, 1927. Vassar College.)

Black, Davidson. The Aeneolithic Yang Shao People of North China. (Transac. 6th Congr. Far Eastern Assoc. of Tropical Medicine, 1925. 3 pages.)

Bolton, Herbert Eugene. Escalante in Dixie and the Arizona Strip. (New Mexico Hist. Rev., 3: 41–72, 1928.)

Brigham, A. P. The United States of America. (New York: Oxford Univ. Press, 1927. $3.00.)

Brody, Samuel. A Comparison of Growth Curves of Man and Other Animals. (Science, n. s., 67: 43–46, 1928.)

Bushnell, David I., Jr. Drawings by John Webber of Natives of the Northwest Coast of America, 1778. (Smith Misc. Coll., 80: 1–12, 12 ills., 1928.)

Caso, Alfonso. Las Ruinas de Tizatlán, Tlaxcala. (Revista Mexicana de Estudios Historicos, 1: 1–34, 1927.)

Champion, M. Observations techniques sur les trouvailles de Glozel. (Revue anthropologique, 38: 23–33, 1928.)

Chanda, Ramaprasad. The Beginnings of Art in Eastern India. (Mem. Arch. Survey of India, 30: 1–54, 7 pls., price 5s. 9d.)

Chinnery, E. W. Pearson. Certain Natives in South New Britain and Dampier Straits. (Territory of New Guinea Anthr. Rep., 3: 1–102, 1928.)

Collie, George L. The Aurignacians and Their Culture. (Logan Mus. Bull., 1: 1–135, 1928.)

Densmore, Frances. The Melodic Formation of Indian Songs. (Journ. The Wash. Acad. Sci., 18: 16–24, 1928.)

Dixon, Roland B. The Building of Cultures. (New York: Charles Scribner's Sons, 1928. $4.00.)

Dunn, Leslie. An Anthropometric Study of Hawaiians of Pure and Mixed Blood. (Paps. Peabody Mus. Amer. Arch. Ethn., Harvard Univ., 11: 91–210, 1928.)

Eckstorm, Fannie H., and Smyth, Mary W. Minstrelsy of Maine. (Boston, Mass.: Houghton Mifflin Co., 1928. 400 pp., $3.50.)

Estabrooks, G. H. A Proposed Technique for the Investigation of Racial Differences in Intelligence. (The Amer. Naturalist, 67: 76–87, 1928.)

Ferguson, William P. F. Michipicoten. (35th Ann. Arch. Rep., 1924–1925: 31–34, Toronto, 1927.)

Journ. Am. Folk-Lore. Vol. 3, No. 9. June 1890

never defeated. There will be mentioned, also, all the treasons which Ganelon, of Mayence, hatched against Charles and his court, corresponding secretly with the Saracens to overthrow his greatness and that of his forces. Nor shall be concealed what Malagigi wrought with magic power of his for the benefit of the invincible Charles; rather, you shall hear, as usual, how he commanded all hell for the safety of the men of Chiaramonte and of Montalbano.

"No. 25 Union Street, South Brooklyn.

"Seats reserved for ladies."

From the Public Ledger, Philadelphia, April 19.

In the concluding chapter of Mr. Leland's book, "The Gypsies," Boston, 1882, he discusses "Shelta, the Tinkers' Talk," and points out the existence, throughout the British Isles, of a secret Cant or language employed by tinkers and tramps, a jargon evidently of Celtic origin. With reference to this caste of "tinkers," the "Journal of the Gypsy Lore Society," vol. i. No. 6, pp. 350–357, contained an article by Mr. David MacRitchie, entitled "Irish Tinkers and their Language." The last number of the Journal named (vol. ii. No. 2), under the head of "Notes and Queries," contains a communication respecting "Shelta," which is here transcribed. No doubt there may be opportunities in the United States for obtaining information respecting this jargon or language.

"Shelta," The Tinkers' Talk. — My first acquaintance with "Shelta" was made in the summer of last year, while I was spending some holidays in the island of Tiree, off the west coast of Argyll. A lady friend of mine, who resided in the island, gave me some words and phrases she had obtained from a little tinker girl some time before.

She obtained the words in the following way. One day, going by chance into the kitchen, she found there a tinker boy and girl, who had come round begging. Entering into conversation with them in Gaelic (I believe they spoke no English) she was informed by the little girl that — to quote her words — "We have a language of our own." My friend asked her to tell some of the words, and on her doing so, wrote them down. As they had a Gaelic ring about them, she wrote these words according to the Gaelic mode of spelling.

On their return home the little boy "told" on his sister, and next day their mother came along to see my friend. She said the words did not belong to any language at all, but had been made up by the little girl herself. This my friend knew was not true, as the boy had also shown a knowledge of the language. On my showing the words to a friend I was advised to send a copy of them to Mr. C. G. Leland, and get his opinion concerning them.

This I did, and was informed by that gentleman that the words belonged to the "Shelta" language, and was referred to his own book, "The Gypsies," in which "Shelta" was first made public. On reading that book I find that some of my words are the same as Mr. Leland's, allowing for the different systems of spelling. I here give the words and phrases as I got

them, and to these I have added some notes, showing the words I consider similar to those of Mr. Leland, and those — both of my own list and Mr. Leland's — that I consider are similar to and connected with the Gaelic.

I agree with Mr. Leland that "Shelta" is *not* Gaelic, because my friend and I went over the words, trying to find some connection between the two languages. "Shelta" has, however, both Gaelic and slang words mixed up with it.

Words obtained from tinker girl in island of Tiree: —

noìd = a man.
beor = a woman.
peartaig, a girl.
glomhach, an old man.
liogach bin, a small boy.
suillean, a baby.
mo chàmair, my mother.
mo dhatair, my father.
clèidean, clothing.
luirean, shoes.
pras, food.
turan, a loaf.
tur, fire.
reagain, a kettle.
sclàiaich, tea.
mealaidh, sweet.
cian bin, a tent.
cian toim, a white house, or cottage.
gifan, a horse.
blànag, a cow.
deasag shean, a ragged, old, or dirty person.
deasag toim, a pretty, clean, or neat person.
air a sgeamhas, drunk.
s' deachag òb, I am tired.
s' dèis sium a meartsacha air a charan, we are going on the sea.
noìd a maslachadh air an lanach, a man walking on the highway.
s' guidh a bagail air mo ghil, it is raining.

Comparing the Tiree list with Mr. Leland's words, I observe as follows: —

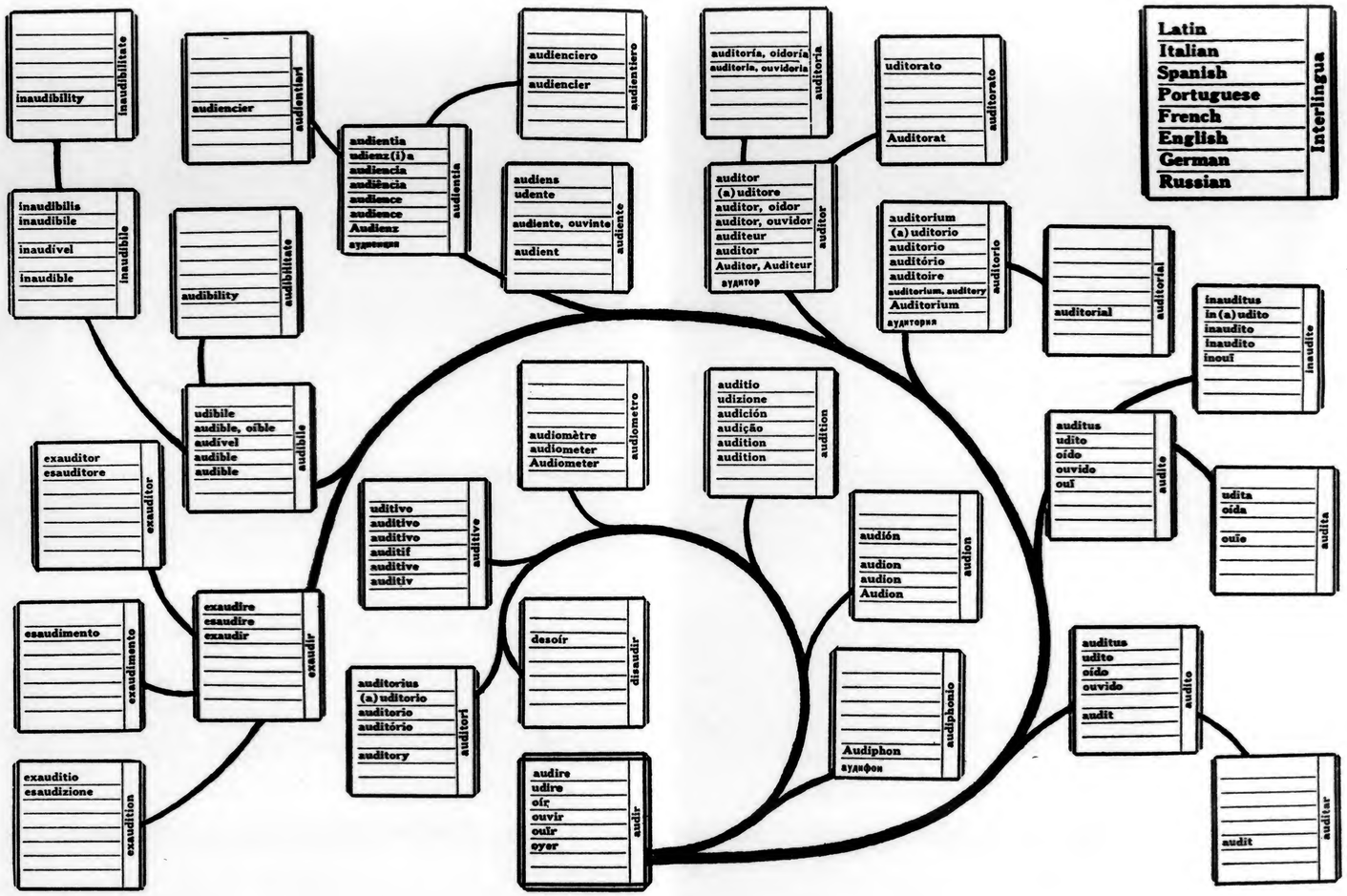
Beor is similar to *bewr*, a woman; *bin* (pron. been) = *binny*, small; *pras* = *brass*, food; *tur*, fire = *terri*, fuel; while *turan*, a loaf (or more probably an oat-cake baked at the fire), and *terry*, a heating iron, are connected with *tur*; *sgeamhas* = *ishkimmish*, drunk. To the ear of an English-speaking person, the way in which *sgeamhas* is pronounced, viz., with a preliminary breathing, would suggest that it was spelled with an *I*, prefixed to the word proper. *Cian*, a tent or dwelling = *kîéna*, a house.

Mo is Gaelic for my, and *dhatair* is probably connected with *athair*, the Gaelic for father.[1]

Mealaigh is apparently connected with Gaelic *milis*, sweet; and *shean* with Gaelic *sean*, old. *Air a sgeamhas* is probably literally translated by "on the spree;" *air a* is Gaelic for "on the."

[1] It is to be noted, however, that *dad*, or *dada* = "father" in many Gypsy dialects; and that it takes the form "*dat*chen," in one instance, in the north of England (as stated by Mr. Sampson, at p. 3 of the present volume of our Journal). *Dad*, or *dada*, is also used by some Gaelic-speaking castes in Ireland, of which, we believe, the population of *The Claddagh*, Galway, is an instance. Cf. Welsh *tad* = "father," and the ordinary *dad* and *daddy* of familiar English speech. — ED.

The Modern Range of Latin *audire*



The chart to the right* shows the pattern of the etymological family of Latin *audire* as represented by derivational series in classical Latin and present-day Italian, Spanish, Portuguese, French, English, German, and Russian. Corresponding forms drawn from the various languages are combined in squares each one of which represents a distinct morphological type. The links from square to square correspond to derivational links. The order in which the various branches are arranged within the chart is a matter of layout convenience. The vertical space in each square is given over to a synthetic form the function of which represents one aspect of the topic of this study.

As a comprehensive analysis of the international range of one etymological family, this survey covers the material embodied in the chart supplemented by semantic data which have been checked against various standard dictionaries. The presentation as a whole should be considered a typical case history. Similar studies of other international word families —of Latin as well as non-Latin origin—would be similarly enlightening.

The Latin family of *audire* consists of fourteen classical formations with corresponding forms in at least one modern language.

The meaning of *audire* is extended in classical Latin from 'perceiving through the ear' to 'understanding' and thence to both 'obeying' and 'granting.' The same extensions are encountered in English *to hear* as illustrated by "You heard (=understood) what I said," the older usage "The horse hears (=obeys) the reins," and "God hears (=grants) our prayers." The perfective idea of hearing as in "the gods hear our prayers" is concentrated in Latin in the compound *exaudire* whose prefix has the exact value of German *er-* in *erhören*.

The Latin affix formations built on *audire* exhibit no unexpected features either in form or meaning. *Audiens* is a participial adjective and signifies in substantival use 'a hearer, one who hears' (in all the senses of *audire*). *Audientia* is 'a hearing,' also 'the faculty of hearing' and by metonymy 'the ears.' *Inaudibilis* is a nonce formation with the expected meaning of 'inaudible' and is not demonstrably supported by a positive **audibilis*. The verbal noun *auditus* is a synonym of *audientia* except that it lacks the metonymous meaning of 'ears.' *Auditor* is 'a hearer,' specifically 'one who listens to a teacher' and hence 'a pupil.' *Auditio* is again both 'a hearing' and 'the faculty of hearing,' but also 'that which is heard,' i.e. both 'a rumor' and 'a lecture or lesson.' The adjective *auditorius* is again a nonce formation with the meaning of 'connected with the sense of hearing.' *Auditorium* is 'a hearing,' specifically 'a hearing in court' and hence 'a place where a hearing occurs,' as 'a school,' 'a lecture hall,' but also 'an audience,' i.e. 'the people listening.' *Exauditio* is 'a hearing granted' and hence 'a grant.' *Exauditor* is 'one who grants.'—A few Latin formations which have left no trace in any modern language have been omitted from this survey, e.g. the compound *indaudire* and its derivatives.

Among the forms listed, the rate of survival in direct continuity up to the modern languages is not impressive. The basic infinitive survives in Italian *udire*, Spanish *oír*, Portuguese *ouvir*, and French *ouïr*. All these words correspond both etymologically and semantically with Latin *audire* except that they lack the latter's extended meaning 'to obey.' The French word is largely replaced by *entendre*.

The only other direct survival is Portuguese *oução* from *auditio* whose meaning, 'a mite' (earlier, 'an earwig'), excludes it from this survey.

All the modern infinitive forms corresponding to *audire* can be used as nouns. The French infinitive in that use passed into English as the legal term *oyer*. Otherwise, none of the Romance forms descending directly from Latin *audire* has passed from one language into another.

In the Romance languages themselves these forms have hardly gone beyond the formation of purely grammatical derivatives, as the past and present participles. The past participle has yielded the French compound *ouï-dire* 'hearsay.' A substantivized form of the past participle appears in all the Romance languages with the meaning 'sense of hearing.' In Italian, Spanish, and Portuguese the forms are masculine (*udito, oído,* and *ouvido* respectively) and may, strictly speaking, be the Latin verbal noun *auditus* rather than the homophonous substantivization of the past participle. In French this same meaning is rendered by the feminine form *ouïe*. The Italian and Spanish feminine forms *udita* and *oída* signify 'process of hearing, hearsay.' In its negative form, with the meaning 'unheard, unheard-of,' the past participle is used in all the Romance languages as an adjective of high frequency. Finally, Spanish has based on *oír* the adjective *oíble* 'audible.'

If the etymological family of *audire* has considerable and widely diffused international importance, it owes this fact only secondarily to the traditional forms descended directly from Latin. The internationally important members of the family are all borrowings from Latin, and the borrowing process is shared in equally by languages outside the Romance sphere. As a matter of historical fact, English, German, and Russian did take some such words from a Romance language or from one another rather than directly from Latin, but in such cases the contributing language functioned only as a go-between and the forms borrowed do not reveal their not having been taken over from the original Latin. On the whole, the Romance languages occupy in this no privileged position but

* Reprinted from *Interlingua-English, a Dictionary of the International Language*, prepared by the research staff of the International Auxiliary Language Association under the direction of Alexander Gode, Ph.D. (New York: Storm, 1951. 480 pp. $5).

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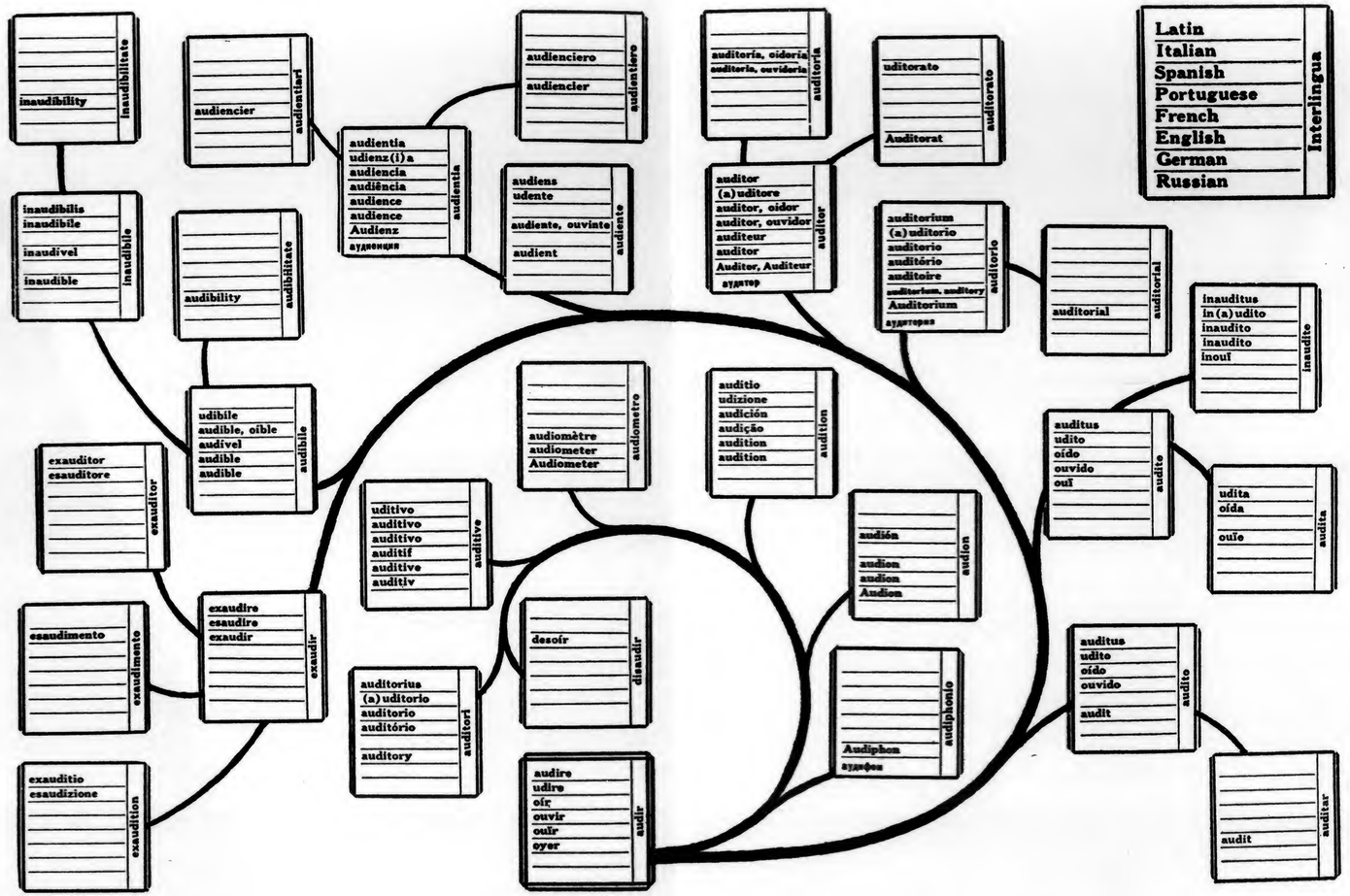
y, strictly speaking, be the Latin
us rather than the homophonous
f the past participle. In French
is rendered by the feminine form
and Spanish feminine forms
nify 'process of hearing, hearsay.'
rm, with the meaning 'unheard,
past participle is used in all the
es as an adjective of high fre-
Spanish has based on *oír* the ad-
ble.'

gical family of *audire* has con-
dely diffused international im-
this fact only secondarily to the
descended directly from Latin.
ly important members of the
rowings from Latin, and the bor-
shared in equally by languages
nce sphere. As a matter of his-
lish, German, and Russian did
rds from a Romance language or
rather than directly from Latin,
the contributing language func-
-between and the forms borrowed
not having been taken over from
n. On the whole, the Romance
in this no privileged position but

The Modern Range of Latin *audire*



are simply members of a group of occidental languages more or less strongly exposed to the influence of the Latin tradition.

As the modern languages borrow *audire*-derivatives from Latin (directly or via a fellow language), it is interesting to note that only Italian allows its borrowings to be associated in form with traditional members of the same etymological family. Thus Italian *inaudito* from Latin *inauditus* has a secondary form *inudito* which may either be considered a variant of *inaudito* influenced by the *udire*-group or a straight derivative from *udire* itself. Parallelly Italian has the doublets *auditorio-uditorio*, *auditore-uditore*, and the formations *udizione*, *udente*, *udibile* which again may be considered assimilated borrowings from Latin or derivatives from *udire*. A somewhat similar type of doublet is represented in the Iberian languages by Spanish *audible-oíble* and Portuguese *audiente-ouvinte*. In both these cases the term borrowed from Latin is a neologism added to its traditional synonym. In French the borrowings from the Latin *audire*-group remain completely unassociated with the traditional *ouïr*-family. In the non-Romance languages there are in this family no traditional words (excepting English *oyer*) with which the new borrowings from Latin could be linked up.

The words borrowed by the modern languages from Latin—be it directly or indirectly—are *auditor*, *auditorium*, *audientia* in Italian, Spanish, Portuguese, French, English, German, Russian; *auditio* in the same languages except German and Russian; *audiens* in Italian, Portuguese, English; *inaudibilis* in Italian, Portuguese, English; *auditorius* in Italian, Spanish, Portuguese, English; *exaudire* in Italian, Spanish; *exauditor and exauditio* in Italian. In all these cases the modern forms show merely a normal suffix assimilation and coincide semantically with the Latin except for minor though complex additional connotations.

These words, though taken individually from Latin, reconstitute in the modern languages derivational patterns which (1) may link up with traditional words (as Italian *auditorio* which, linked with *udire*, yields a secondary *uditorio*) and (2) may expand as though in their slightly modernized garb Latin had come to life again.

Just as Latin could have formed **audibilis*, the modern languages form back from their equivalent of *inaudibilis* the positive forms of Italian *udibile*, Spanish *audible*, Portuguese *audivel*, French and English *audible*. In all the languages just listed and also in German the expansive potential of the *audire*-family produces a form which in classical Latin would have been **auditivus*. Other "potentially" Latin formations occurring here and there in the modern languages are English *auditorial*, *to audit*, *audibility*, *inaudibility*; Italian *esaudimento*; Spanish *desoír*; French *audiencier*, Spanish *audenciero*; Italian *uditorato*, German *Auditorat*. In Spanish a derivative in *-ia* is developed from both *auditor* and *oidor*. The corresponding formations occur likewise in Portuguese.

In the modern languages the formative urge of the Latin *audire*-family goes beyond the historical possibilities of Latin. The element *audi-* appears in technological compounds in conjunction with the elements *-phone*, *-o-meter*, and the fanciful suffix *-on*.

A careful check of the items represented in this survey will reveal the fact that some forms not listed for a particular language do exist according to some dictionary which happens not to have been used in the present study. The only significance of this observation is the support it lends to the contention that all the formations listed for a limited number of languages are potentially present everywhere else as well. So German *Audiphon* is French **audiphone*; English *inaudibility* is Italian **inaudibilità*; French *audiomètre* is Italian **udiometro*; Italian *udire* is German **audieren*; etc.

The pattern-forming force characteristic of this family in the various modern languages is not uniform. The suggestion that it might produce a French word **inaudibilité* will be less repulsive to a speaker of French than the suggestion that it could normalize *ouïr* to **audir*; the German **Exaudiment* may seem less acceptable than **Inaudibilität*; etc.

The completion and normalization and possible expansion of the *audire*-family in the individual languages is doubtless little more than a pleasant game. But when this "game" is pursued in the Western languages as a group, there emerges the conception of a "perfect" or "ideal" pattern which is manifest but not actually achieved in each one of the various "imperfect" patterns in the individual languages. This "proto-pattern," as it might be termed, is partially characteristic of each one of the languages considered when viewed individually; it is fully characteristic of the body of languages considered when viewed as one whole, i.e. as one composite language.

In the chart to the left the forms of the "proto-pattern" are entered in vertical spaces identified in the list of language names by the term Interlingua. The Interlingua forms are composite forms representing in each case the prototype of single-language variants viewed in the context of the entire derivational family. The Interlingua family of *audir*—in contrast to the corresponding families in Italian, French, Spanish, etc., and not excepting Latin—is complete and "perfect" in the sense that none of its members exhibits idiosyncratic deviations from the family pattern.

The case of the Latin family of *audire* is one representative illustration. The observations based on a detailed perusal of it apply *mutatis mutandis* to countless international word families of both Latin and non-Latin origin. In their totality they offer a graphic picture of the basic homogeneities in the Western languages. A practical working vocabulary of 27,000 Interlingua forms has been compiled in the *Interlingua-English Dictionary* which will serve simultaneously as the vocabulary of an international auxiliary language.

A. Gode-von Aesch

PHILOLOGY

History Through Language

"A Classic of Science"

Words Common to Many Languages Give Clues to Customs Of Our Savage Ancestors, Which Archaeologists Check

THE ORIGIN OF THE ARYANS, An account of the Prehistoric Ethnology and Civilisation of Europe. By Isaac Taylor. New York, Scribner & Welford, 1890. This is an exact reprint of extracts from the original publication.

WHEN towards the close of the last century Sanskrit and Zend became known to European scholars, the new science of Comparative Philology came into existence. The first stone of the edifice was laid in 1786, when Sir William Jones made the memorable declaration that the similarities between Sanskrit, Greek, Latin, German, and Celtic could only be explained on the hypothesis that these languages had a common parentage. Hegel hardly exaggerated the consequences of this discovery when he called it the discovery of a new world.

Fifty years elapsed before Bopp succeeded in establishing, as a settled conclusion of science, what had hitherto been little more than a probable hypothesis. His *Comparative Grammar,* published in 1833-35, has been superseded in its details by other works, and it has now only an historical interest. But to Bopp belongs the honour of having discovered the method of the comparison of grammatical forms, which at once placed Comparative Philology on a scientific footing. In this and subsequent works Bopp showed that Zend and Slavonic, as well as Albanian and Armenian, must be included in what he called the Indo-Germanic family of speech.

The great linguistic family, whose existence was thus established, embraces seven European groups of languages—the Hellenic, Italic, Celtic, Teutonic, Slavonic, Lithuanic or Lettic, and Albanian; in fact, all the existing languages of Europe except Basque, Finnic, Magyar, and Turkish. There are also three closely related Asiatic groups: the Indic, containing fourteen modern Indian languages derived from Sanskrit; secondly, the Iranic group, comprising Zend, Persian, Pushtu or Afghan, Baluchi, Kurdish, and Ossetic; and, thirdly, the Armenian, which is intermediate between Greek and Iranian.

No name, altogether unobjectionable, has been devised for this family of speech. Japhetic, modeled after the pattern of Semitic and Hamitic, involves the assumption of a descent from Japhet. Caucasian is both too narrow and too broad, and, if used at all, is applicable to race rather than to language. Sanskritic gives undue prominence to one member of the group. Indo-Germanic and Indo-European are not only clumsy, but inaccurate. The first, adopted by Bopp, is a favourite term in Germany; but French and Italian scholars see no reason why German should be taken as the type of European speech. Indo-European, which they prefer, is too narrow, since it excludes Iranian and Armenian, and too broad, since the languages in question are spoken only in a part of India and a part of Europe.

Aryan, a term invented by Professor Max Müller, is almost as objectionable as Sanskritic, since it properly designates only the Indo-Iranian languages, in which sense it is used by many continental scholars. Moreover, it tacitly implies or suggests that the ancient Ariana, the district round Herat, was the cradle of the Aryan languages, and thus begs the whole question of their European or Asiatic origin. However, since the term has the great merit of being short and compact, and since it is almost universally adopted by English writers, and is increasingly used in France and Germany, it will, in spite of its manifold demerits, be employed in the ensuing pages. . . .

It cannot be insisted upon too strongly that identity of speech does not imply identity of race any more than diversity of speech implies diversity of race. The language of Cornwall is the same as the language of Essex, but the blood is Celtic in the one case and Teutonic in the other. The language of Cornwall is different from that of Brittany, but the blood is largely the same. Two related languages, such as French and Italian, point to an earlier language, from which both have descended; but it by no means follows that French and Italians, who speak those languages, have descended from common ancestors. The most inexperienced eye can distinguish between a Spaniard and a Swede, and yet both speak Aryan tongues, and even in Northern and Southern Germany there is a manifest difference of race, though the language is the same.

PRIMITIVE OX-CART

Pictured on a Thracian coin. This type of vehicle, whose wheel had no hub, was one of the earliest inventions of the "Aryan" races.

The Neolithic Culture

It is plain that the civilisation which we find in Europe at the beginning of the historic period was gradually evolved during a vast period of time, and was not introduced, cataclysmically, by the immigration of a new race. Just as in geological speculation great diluvial catastrophes have been eliminated and replaced by the action of existing forces operating during enormous periods of time, so the prehistoric archaeologists are increasingly disposed to substitute slow progress in culture for the older theories which cut every knot by theories of conquest and invasion.

The most recent results of philological research, limited and corrected as they have now been by archaeological discovery, may be briefly summarised. It is believed that the speakers of the

FIELDS

ENTOMOLOGY

Bees "Gang Up" On Insect Murderer

IRATE CITIZENS of a beehive at the Brooklyn Children's Museum recently made short work of an insect thug that had killed two of their fellows and was threatening the lives of others.

The aggressor was a praying mantis, one of the big species that has become established in the New York region as an immigrant from the Orient. Mantises are carnivorous insects, preying on other insects by catching them in their powerful folding forelegs and chewing them up with their powerful jaws.

This particular murderer caught two bees, one in each foreleg, and devoured them at his leisure. Then he made for a third bee nearer the entrance of a hive. Instantly the bees fell upon him by dozens and hundreds, until the angrily buzzing mass was as big as a baseball. Unable to pierce his tough wings, they turned him over on his back. Then they inflicted swift and final punishment with their stings.

Science News Letter, October 29, 1932

MARINE BIOLOGY

American Oysters Mate With Japanese

REGARDLESS of politico-economic differences between the statesmen who eat them, Japanese and American oysters get along most amicably together. They are perfectly compatible in their mating activities, Dr. P. S. Galtsoff and R. O. Smith of the U. S. Bureau of Fisheries have found. The two investigators report their results in *Science*.

Sex in oysters is a quite topsy-turvy affair, from the higher-vertebrate point of view. The same individual is first male, then female. Both sexes discharge their sex cells into the water, and sperm-cells find and fertilize eggs as they float.

Dr. Galtsoff had previously shown that oysters in the female phase could be induced to discharge their eggs by the presence in the water of a small amount of the male sex element. American oysters would not respond to the sperm of any but their own species.

However, Dr. Galstoff and Mr. Smith have now discovered that oysters of a quite different species brought over from Japan supply sperm that stimulates female American oysters; and conversely, sperm from male American oysters causes egg discharge by the female Japanese bivalves.

The two species of oysters not only thus stimulate each other's egg-laying activities, but actual hybridization takes place, the two investigators report. The young hybrid oysters show no higher mortality than control cultures of the uncrossed parent species, and they appear to grow in healthy, normal fashion.

Science News Letter, October 29, 1932

GEOLOGY

Enormous Fuel Deposits Discovered in Germany

GERMANY'S fuel resources have received an important addition through the discovery of deeply buried lignite beds of enormous thickness, in the lower Rhine district. Exploratory deep borings indicate a total area of approximately a thousand square miles, with a maximum thickness of over 500 feet, Dr. Hans Breddin of the Aachen Mining Institute informed a Science Service correspondent. It is estimated that the deposit contains more fuel than the Pennsylvania coal beds, and at least fifty per cent. as much as all the exploitable coal reserve of Great Britain.

Lignite, or "brown coal" is a type of fuel softer than ordinary soft coal. Pressed into briquets, it is by far the most widely used domestic fuel in Germany and is much used under steam boilers as well.

The present open pit lignite mines operated in the lower Rhine region already yield about a fourth of Germany's total lignite output, and they only nibble the edges of the huge deposit described by Dr. Breddin. The present workings have developed where the overlying layers of earth and rock were thinnest. To get at the best of the newfound beds it will be necessary to go through an over-burden as much as 1,500 feet thick, often containing water-bearing strata which will make the job of mining much harder. It will be necessary to organize mining plants on a titanic scale to bring about the most profitable exploitation of the beds.

Science News Letter, October 29, 1932

ENGINEERING

No Big Industry Seen In Steel House Production

IN THE FACE of a virtual epidemic of steel residences springing up all over the country, the U. S. Steel Corporation has decided that the mass production of standardized steel houses will not become a big new industry.

A survey of 56 new systems of steel construction now invading the brick, mortar and lumber industries was made before this conclusion was reached, F. T. Llewellyn, consulting engineer for the Steel Corporation, told the American Institute of Steel Construction at Pittsburgh.

Mr. Llewellyn believes, however, that houses of individual design using standardized steel units will furnish the chief demand for steel for home building. He said the survey showed that conditions attending the construction of residences have very little in common with those fields in which multiple production methods are applicable, such as in the manufacture and marketing of automobiles.

It was announced that a booklet describing new uses for steel in the home is being prepared.

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ZOOLOGY

The Owl and The Pussycat Rivals at Mouse-Catching

See Front Cover

ONE of the favorite riddles of childhood was, "Spell 'mousetrap' in three letters"; and the answer was "C-A-T." With even more appropriateness the answer might have been "O-W-L," for the Owl is an even better mousetrap than the Pussycat, besides being somewhat more restrained in the matter of midnight serenades, and not addicted to messing up the place with frequent litters of kittens. Mankind might well look upon owls as special gifts of Providence for the abatement of mice. Owls, on the other hand, might consider men as special gifts of Providence for the building of barns to live in, and the cultivation of grain crops to insure an abundant supply of mice. It all depends on the point of view.

The solemn gentleman portrayed on the cover of this issue of the SCIENCE NEWS LETTER posed for Cornelia Clarke.

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primitive Aryan tongue were nomad herdsmen, who had domesticated the dog, who wandered over the plains of Europe in waggons drawn by oxen, who fashioned canoes out of the trunks of trees, but were ignorant of any metal, with the possible exception of native copper. In the summer they lived in huts, built of branches of trees, and thatched with reeds; in winter they dwelt in circular pits dug in the earth, and roofed over with poles, covered with sods of turf, or plastered with the dung of cattle. They were clad in skins sewn together with bone needles; they were acquainted with fire, which they kindled by means of fire-sticks or pyrites; and they were able to count up to a hundred. If they practised agriculture, which is doubtful, it must have been of a very primitive kind; but they probably collected and pounded in stone mortars the seeds of some wild cereal, either spelt or barley. The only social institution was marriage; but they were polygamists, and practised human sacrifice. Whether they ate the bodies of enemies slain in war is doubtful. There were no enclosures, and property consisted in cattle and not in land. They believed in a future life; their religion was shamanistic; they had no idols, and probably no gods properly so-called, but reverenced in some vague way the powers of nature.

This general picture of primitive Aryan culture has now to be substantiated in detail, and the gradual progress in civilisation and the arts of life has to be traced from the scanty materials which we possess.

Metals

That the Aryans before the linguistic separation, were still in the stone age may be inferred from the fact that no Aryan etymology has been found for the word "metal," which is regarded by Oppert and Renan as a Semitic loanword obtained from the Phoenicians. There is no common word in Aryan speech to denote the art of the smith, and many of the words relating to his trade refer primarily to stone. Each of the Aryan families of speech has an independent name for the smith, a sufficient proof that the arts of smelting and forging metal were later than the linguistic separation. More especially the old theory that the Celts were the vanguard of the Aryan race, who brought with them into Europe the knowledge of metals, falls to the ground, in face of the fact that the Celts have for the smith their own peculiar designation, *goba,* which bears no resemblance to the corresponding words in other Aryan languages, such, for instance, as the Latin *faber,* the Greek *chalkeus,* the Teutonic *smid,* or the Slavonic *vutri*. . .

Cattle

The wealth of these primitive people consisted almost wholly of their herds. This is indicated by the fact that the collective name for cattle, which appears in Latin, Sanskrit, Zend, Lithuanian, and German, denoting originally that which has been tied up, has been the source of numerous words denoting property and money, such as *peculium* and *pecunia* in Latin, and our *fee,* which is the Anglo-Saxon *feoh,* meaning both property and cattle, and identical with the German *vieh,* a cow. The ox, which is figured on early Roman coins, may be a survival from the time when the ox was the standard value and the medium of exchange, and the coin may probably have at first represented the value of the animal. This is supported by the fact that in the Homeric age the measure of value was the ox. The arms of Diomed are worth nine oxen, those of Glaucus are worth an hundred. The tripod, which was the first prize for the wrestlers, was worth twelve oxen. One female slave is valued at twenty oxen, another at four. . . .

Dress

The clothing of the Aryans of the neolithic and even of the bronze age consisted chiefly of the skins of beasts, the flesh, and perhaps the hair, having been removed by stone scrapers, which are extremely numerous, even as late as the bronze age. These skins were sewn together by means of bone needles, which are found in great abundance. Caesar says of the Britons *pellibus sunt vestiti,* and Tacitus tells us that the same was the case with some of the Germans. In the Swiss and Italian pile dwellings fragments of leather, tanned by some rude but effective process, have been found.

Flax, whose very name implies that it was used for weaving (Latin *plecto,* German *flechten*), was spun and woven by the women of the neolithic household, as is evidenced by the spindle whorls and loom weights so abundantly found in the Swiss dwellings of the stone age. In several settlements linen fabrics have been discovered. The threads of the warp, consisting of two fibres of flax twisted together, must have been hung with weights from a

LOWER PAGE

Shower of Stars

Which fell on the night of Nov. 12-13, 1833, is described by eye-witnesses in

THE NEXT CLASSIC OF SCIENCE

MEDICINE

Sick Scientist Calls "Mild" Wrong Word for Typhus

TYPHUS FEVER in the United States is officially termed mild endemic American typhus. Dr. R. E. Dyer, U. S. Public Health Service scientist who was stricken with the disease while investigating it, now thinks the word mild hardly strong enough to describe it.

"Where do they get that mild stuff?" Dr. Dyer ironically asked fellow scientists who have visited him at the U. S. Naval Hospital where he is slowly recovering from the disease.

Dr. Dyer has been ill since October 1, and is not yet able to sit up, though he is already directing the work of his assistants in the laboratory. Visitors find that he shows plainly the effect of the acute illness he has suffered. He is haggard and has the appearance of a man who has been very sick. His normally strong, masculine voice is now weak and quavering. Yet he has retained his optimistic outlook on life and is keenly interested in the typhus fever research.

Dr. Dyer directed the work which resulted in discovering the flea as the carrier of American typhus fever, and he and his associates have been trying to develop a vaccine to give immunity to the disease.

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horizontal bar, the similar threads of the woof being interlaced by means of needles of bone or wood. That the flax was cultivated is shown by the stores of linseed which have been found. In some of the earlier settlements in Southern Germany, where flax was unknown, ropes and mats were made of bast, prepared from the bark of the clematis or the lime. There is no evidence that hemp was known in the age of stone or even of bronze.

Curiously enough, though flax was so commonly used for weaving in the stone age, there is no evidence in the pile dwellings of Switzerland or Italy of the weaving of wool, even in the bronze age, when sheep had become numerous. Evidently the sheep skins were worn with the wool on, as is still the case with the peasants of Central and Southern Italy. Woollen fabrics have, however, been found in Jutland, and in Yorkshire, associated with interments of the bronze age. . . .

The Boat

Some sort of boat, or rather canoe, must have been constructed in the primitive period, since the Latin *navis* can be traced in Sanskrit, Greek, Celtic, and Teutonic. But the word cannot at first have denoted more than the trunk of a tree hollowed out by the stone axe, with the aid of fire. This is indicated by the etymological relation of the Sanskrit *daru,* a boat, to the English *tree,* and the Celtic *daur,* an oak. Similarly the old Norse *askr* denotes a boat as well as an ash tree. Several "dug-outs," hollowed out of a single trunk, have been found in the neolithic lake settlements of Switzerland, Italy and Ireland. The Celtic *barca,* the old Norse *barki,* and the English *barge* and *barque* are indications that the Northern Aryans also constructed canoes of the bark of some tree, probably the birch.

The canoes were propelled by oars or poles, since the Latin *remus* can be traced in Sanskrit, Greek, Celtic, and Teutonic. Sails, however, were unknown in the primitive period, as is shown by the fact that the German *segel,* our *sail,* is a loan-word from the Latin sagulum. Thus the Teutonic invasions of England were only made possible by previous contact with Roman civilisation.

An examination of the nautical terms in Latin yields some curious results. According to George Curtius, they divide themselves into three classes. We have first the proto-Aryan words *navis* and *remus;* secondly, *velum* and *malus,* which are words of Italic origin, not belonging to the general Aryan vocabulary; and thirdly, a large number of loan-words from the Greek, such as *gubernare, ancora, prora, aplustre, anquina, antenna, faselus, contus,* and *nausea.* Hence it would appear that the undivided Aryans had invented canoes and oars, that the mast and the sail were used on inland waters after the linguistic separation of the Italic and Hellenic races, while the fact that the Latin word for sea-sickness is a loan-word from the Greek may indicate that the Italic peoples did [not?] venture to navigate the sea before they came in contact with Greek civilisation. It has already been noted that while the words relating to pastoral and agricultural pursuits are to a great extent identical in Greek and Latin, those referring to fishing, such as the names of the net, the line, and the hook, are entirely unrelated.

The Ox-Waggon

Indubitably the greatest invention of the primitive Aryans was the ox-waggon. The names of the wheel (Latin, *rota*), of the yoke (Latin, *jugum*), of the wain (Sanskrit, *vahana*), and of the axle (Sanskrit, *aksha*), are common to all Aryan languages. The old Irish *carr* and the Latin *carrus* may also be compared with the *karama* which Hesychius tells us was the name of the covered waggon, or tent upon wheels, in which the nomad Scythians moved from place to place in search of pasturage for their cattle.

On a Thracian coin of the beginning of the fifth century B. C., which is attributed to the Odomanti, who inhabited the pile dwellings in Lake Prasias, we have the earliest representation of the primitive Aryan ox-cart. The body is of wicker-work, poised over the axle, and is drawn by means of a pole by a yoke of oxen. . . .

The primitive ox-waggon must have been constructed without metal. The wheel and the axle were probably in one piece, made out of the section of the trunk of a tree, thinned down in the middle so as to form an axle, and leaving the two ends to serve as wheels. Such waggons are still used in Portugal. They are drawn by oxen, and have two wheels only. A log is cut from the trunk of a tree, and the centre is hacked away, leaving two solid wheels united by an axle.

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SWINGING ROOF GOES UP

ENGINEERING

Sheet Steel Roof Swings Over Building

A STRIP of a novel sheet metal roof is shown by the view above swinging into place over grain elevators at Albany. The long ribbons of steel hang 140 feet between sides of the building as a grape vine swing might loop from tree to tree in the forest. It is claimed that this novel, self-supporting roof, without columns, stanchions or purlins common to other types, is more economical than the usual kind. The strips of steel, which are slightly more than four feet wide, were welded together by the Lincoln Electric Co. More than 400 tons of metal were used.

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Latest scientific methods of removing coats of varnish and dirt from valuable old paintings reveal that modern concepts of some of the old masters' favorite colors have been considerably off-key.

Am. Anthrop., Vol. 7, No. 2. April 1894.

Bread is also subject to contamination in various ways—in the preparation and in the cooking, by the use of poisonous utensils, etc.

In short, *morbidité* may result equally from an excessive or an insufficient régime, a fact which renders this study a social question *par excellence.*

The rich ordinarily eat too much and the poor too little. The great eater furnishes a fertile soil in which infection easily germinates, and inversely an insufficient régime contributes to inanition.

The Orthography of Scientific Language.—M. de Lacaze-Duthiers, president of the French Academy of Sciences, recently opened a séance of that body with a paper upon a subject perhaps a little unexpected, but interesting to very many—"The present orthography of scientific language."

"It is now more than a century," said he, according to *Le Temps*, "since Linnæus proposed his rules, always correct and sensible, which today are too often forgotten. He found that words or terms of too great length become nauseous. This is his expression: 'Nomina generica sesquipedalia, enunciatu difficilia vel nauseosa fugienda sunt,' and Linnæus was right.

"Here is one of these words, and you will excuse me from pronouncing it: Monolasiocallenomonophyllorum.

"What would Linnæus say if he should return in our day and have brought before him to pronounce correctly the modern chemical terms we have here?

"You know that they are seeking to artificially color white flowers. If, then, a part of the audience wishes to have these flowers green, it will be necessary for them to seek a shop for chemical products and demand the acid, diéthyldibenzyldamido-triphénylcar binotrisulfureux, for the purpose of making a solution in which to dip these white flowers. Is it at all necessary to say that this word is of the character of those of which Linnæus said, 'Enunciatu difficilia, nauseosa, fugienda sunt'? Who, then, will say it would not be well (outside of the natural sciences, for which I do not pretend to speak) to follow the principle of Linnæus in making new names a little shorter?

"In conclusion, I declare it here, and it is here that I wish to

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declare it, that I shall be a rebellious recruit in the suppression of the signs characterizing an etymology which cannot be dispensed with. I hold to the retention of phoneticism in the sciences, preserving the orthography and the conventional signs of the etymologies, leaving, then, to live in peace the *ph* and the *y*, the *ch* and the *th*, which render us the greatest service, but leaving also to be eradicated all these peculiarly strange orthographies which have no reason of being and that an inexplicable practice has perpetuated without knowing why.

"In a word, let us preserve a scientific orthography reasonable and useful."

THE TÉRRABA INDIANS.—The Térraba or Tiribi Indians of Costa Rica, Central America, dwell upon the Pacific slope, near the southern border of that country. H. Pittier, who carried on explorations among them in behalf of the territorial government, was brought to believe by their relics that they were a mixture of the various tribes which had been induced to settle in the Diquis valley by the Franciscan missionaries of the eighteenth century. Among them the Terbis or Tervis, who had come from the northern coast, were prominent, and hence the whole assemblage of tribal remnants received the name Terbis or Térrabas. The language of the Térrabas was also adopted by the other portions of the racial conglomerate and, in fact, it is much like the language of the Bribris and other tribes still extant on the Atlantic side of the cordillera.

The Brunka or Bóruka is another cognate people now living three leagues south of the Térrabas. They are of purer origin and are of altogether different appearance. To strangers they communicate words of their vernacular with great reluctance. Dr. William M. Gabb has studied their language extensively and has published a memoir on the whole linguistic group—Guatuso excepted—and Bishop B. A. Thiel has added considerably to our knowledge of it; now H. Pittier is taking up the subject again.

In the preliminaries to his "Ensayo lexicografico sobre la lengua de Térraba" he places the dialects of the Talamanca province in one linguistic family, and to this also pertain the dialects of New Granada eastward to the gulf of Darien, as

Vol. 30, No. 2 - April-June, 1928.

ANTHROPOLOGICAL SOCIETY OF WASHINGTON

The following were elected on January 17, 1928, to serve as officers for the Anthropological Society of Washington for the current year. President, Dr. Charles L. G. Anderson; vice-president, Mr. Frank H. Roberts, Jr.; secretary, Dr. John M. Cooper; treasurer, Mr. Henry B. Collins, Jr.; councillors, Mr. D. I. Bushnell, Jr., Dr. Daniel Folkmar, Mr. Herbert W. Krieger, Mr. Felix Neumann, Mr. B. H. Swales.

LINGUISTIC SOCIETY

The Linguistic Society of America is undertaking to supply in American education a feature which is quite new, a Linguistic Institute devoted to research and courses in linguistic science, general and special. The Institute will run from July 9 to August 18, at New Haven, with the facilities of Yale University at its disposal; it will be managed by a committee of the Linguistic Society, consisting of E. H. Sturtevant of Yale University as Director, R. E. Saleski of Bethany College as Assistant Director, and R. G. Kent of Pennsylvania, Secretary of the Linguistic Society.

The circular which went out in January gives a rich choice of courses. Anthropologists will be most interested in those by P. E. Goddard of the American Museum of Natural History in New York on Linguistic Anthropology, and Methods of Studying Unrecorded Languages; in two courses on Phonetics, by G. O. Russell of Ohio State University; in the Introduction to Linguistic Science, by E. Prokosch of Bryn Mawr; in that on Semantics, by W. Petersen of Florida; but some will have special interests leading them towards the courses in Sanskrit, Greek and Latin, Romanics, Germanics, English, Semitics, Turkish, etc., offered by the staff of twenty-three scholars who form the faculty of the Institute.

New Haven is a pleasant spot for a summer stay, with sea-bathing close at hand. Association with scholars and students of similar interests will be also a strong incentive to attendance. All in all, the Linguistic Society is, by the creation of this Institute, doing a notable service not only to linguistic studies, but to other kindred and overlapping fields of scholarship. Requests for circulars and for information should be directed to Professor E. H. Sturtevant, Director of the Linguistic Institute, Box 1849, Yale Station, New Haven, Connecticut.

Myths

1889-1929

C. Hart Merriam
Papers
BANC MSS
80/18 c

Journ. Am. Folk-Lore — Vol. 2. 1889

NOTES ON SIX NEGRO MYTHS FROM THE GEORGIA COAST. — While reading the stories gathered by Col. Charles C. Jones, Jr., in his interesting collection, "Negro Myths from the Georgia Coast" (1888, Boston and New York, Houghton, Mifflin & Co.), I noticed about half a dozen which bear so striking a resemblance to traditions current in Europe that one can hardly help thinking that they were borrowed.

Here is a list of them, and further investigations will no doubt increase the number: —

No. III., "How Buh Cooter [= Land Terrapin] fool Buh Deer" is the story of the race of the Hare and the Hedgehog. See Grimm, "Kind. u. Hausmärchen," ii. p. 296, ff. — Not necessarily borrowed. Cp. "Vech. d. Berl. Gesellsch. f. Anthrop. Ethnol. und Urgesch." 1887, p. 340; 1888, p. 121.

No. XXIX., "De Two Fren and de Bear," is, in precisely the same form, found in almost every German primer.

No. XXXI., "De King an eh Ring." "Doctor Allwissend" — Grimm, "Kind. u. Hausmärchen," ii. p. 52, f., — is, though slightly differing, essentially the same. Comp., also, No. XXXV. of Jones's collection, p. 90, lines 11 and 12, with Grimm, o. c. II. p. 53, lines 11 and 12.

No. XXXII., "Buh Lion, Buh Rabbit, Buh Fox, and Buh Raccoon" is — *mutatis personis* — the story of the two brothers and King Rhampsinit, told by Herodotus, ii. 121, ff.

No. XXXIV., "De Debble an May Belle" = the German fairy-tale of "König Blaubart."

No. XLI., "Buh Rabbit, Buh Fox, and de Fisherman." For the first part comp. "Le Roman de Renart, publié par Ernest Martin, vol. i. Première Partie du Texte: L'Ancien Collection des Branches" (1882. Strassburg. Trübner), p. 131; Grimm, "Reinhart Fuchs," p. cxxii. Laplandish version in Germania, xv. (1870) p. 162.

No. IV., "Buh Wolf, Buh Rabbit an de Tar Baby." Almost identical is "Tio Conejo (= Uncle Rabbit) and the Watermelons." (Venezula) cp. "Verh. d. Berl. Gesellsch. f. Anthrop. Ethnol. und Urgesch." 1888, p. 274.

Does "Chanticleer," p. 58, point to French influence (cp. Grimm, "Reinhart Fuchs," p. ccxxxvi.) — *Hanns Oertel, New Haven, Conn.*

presentation of considerable data concerning the teeth, with no bias toward theory, and with no attempt at interpretation; although he did make a rather unconvincing effort in that line about a year ago in *The Psychoanalytic Review*.

There is a useful place for a book of this sort, which is written primarily for the dentist and the layman who is interested in the oddities of folkways and in superstitious beliefs, especially as they occur in Europe and Asia. Chapters are devoted to such matters as the cutting of the first tooth, disposing of the first cast tooth, causes and cures for toothache, the use of plant and animal products as remedies, the filing, extraction, and staining of teeth, and the relief of toothache by charms and by intervention of holy persons. One chapter that might be of especial interest to anthropologists is the one devoted to to the primitive use of toothbrush and toothpick.

What seems to be an interesting antithesis in evaluation of data, develops in that Dr. Kanner is so little concerned with dreams about losing a tooth, that he devotes a single paragraph to the subject on the next to the last page, whereas, Dr. C. G. Seligmann in an address before the Anthropological Institute some four years ago, showed that he would make that very subject the opening chapter in any treatise he might write on the folklore of the teeth. The concept of "thunder-teeth" as found in Malaysia, in which Elliot Smith and W. J. Perry have shown some interest, receives no mention. Tooth evulsion in Australia, a problem that Frazer has endeavored to solve, is dismissed with a few paragraphs. And again, the use of teeth as money, as adzes, and the subject of the haggletoothed gods of Mexico receive scant mention, if any at all.

This is because very few data have been derived from anthropological books and papers, almost none from American works; nor have folklore journals been consulted exhaustively. More German works are referred to than English, and many of the former would have been overlooked, probably, had anyone but a physician and surgeon compiled the material. A bibliography is included, but specific book titles and page numbers are rarely given in the text, so that one can hardly employ the work in a reference capacity. Dr. Kanner says that he only looks upon his production as a skeleton for a more comprehensive study in which he hopes many will engage.

H. S. DARLINGTON

Am. Anthropologist. Vol. 31, No. 4. Dec. 1929.

variations from type, such for example as "a St. Francis, a Goethe, or a Darwin, that we have any civilization at all."

The very leisure which our machine civilization engenders may be a source of danger.

Leisure does not automatically produce culture. It may create an opportunity for culture, but it does not guarantee that the opportunity will be developed. And yet sheer idleness—browsing without any particular purpose from one lazy interest to another—may be the means by which we keep the lid from blowing off our high-power civilization.

Machine civilization has led to the unity of civilization.

Into this delicately adjusted mechanism of our modern life comes the savage. The transformation that has revolutionized his world has scarcely touched him.

The organic unity of civilization renders it more easily susceptible to injury, since the whole is as vulnerable as its exposed and weakest parts. What might happen should the old savage stalk into the picture "armed no longer with bows and arrows, but with TNT?"

Under these conditions, no nation can any longer live unto itself. In this new unity of the human race, there are no chosen people nor is there special salvation. There are no longer two worlds—one of Greeks, and another of Barbarians. Today "nations are roped like Alpine climbers crossing a glacier; they survive or perish together."

Science is fast creating not only useful machinery but also tools that may be turned into deadly weapons. Is there intelligence enough to convert destructive into constructive tendencies? "What use will the old savage make of his new civilization?"

For the reviewer to claim the necessary knowledge needed to answer questions which the author frankly leaves unanswered would be presumptuous. He can, however, and should, and in this case does, acknowledge the fact that the author's work has set him thinking and is well calculated to do as much for other readers.

GEORGE GRANT MACCURDY

The Folklore of the Teeth. LEO KANNER. (New York: The Macmillan Company, 1928. 316 pp., 17 figs.)

Most of the material in this book was published serially in *Dental Cosmos* two to three years ago. The author, a surgeon, makes a simple

Am. Anthropologist, Vol. XI, No. 1. Jan. 1898.

useful hand-book. Students of the subject do well to remember that the intellectual differentiation of the sexes, with its multifarious consequences, has grown up with intellectual development; that aphrodisian cults were probably both innocent and beneficent at the times and places of their origin; that they formed incidental and necessary steps in sophic progress, and that it is only erroneous interpretation in the light of modern concepts that renders them awkward or repulsive. Mr Howard's book represents a step in the right direction. W J M.

The Story of Ab; a Tale of the Time of the Cave Man. By Stanley Waterloo. Chicago, Way & Williams, 1897.

An interesting and well-written story attempting to portray life in the Stone age; a historical novel, indeed, although it far antedates the beginning of written history. A recent writer, commenting upon the development and success of the historical novel in recent literature, finds it nearly or quite impossible to depict the manners and customs of times but slightly removed from our own. The complex web of human activities is too intricate for us to unravel. What shall we say, then, of going back to the very dawn of humanity and depicting the life of the primeval savage? Our author has, however, done this extremely well. Without straining for effect or producing any anticlimax by absurd situations, the life of a young cave boy is told. The terrible struggle for existence, the conflicts of the people with the cave bear and the saber-tooth tiger, their loves, their hates, and their wars, are graphically told, and we become convinced by the writer's art that life must then have been something like his picture. Some little shadow of incredulity may linger in the mature mind when it is found that within the small neighborhood circle of the book the arts of making bows, of polishing stone implements, and of preparing dead-falls for animals were all discovered. To the boy, who was doubtless the auditor our author had chiefly in mind, all these would seem natural; for what boy ever saw anything absurd in that queer farrago of impossible natural history known as the Swiss Family Robinson? This book may well interest readers of a larger growth, for it is by far the best popular account of the main facts of the Stone age that we have ever seen.

section) brought a description of the Underground World by the shamans of the tribe, illustrated with sketches drawn by the shamans, with accompanying explanation. Lantern slides of these sketches are presented with the paper.

W. G. Bogoras in comparing the shamanistic call and the period of initiation in Asia and in some parts of North America finds that a North American Indian, when wanting to come in contact with spirits must make a very active search for them. The essential element for such a quest is the infliction of self-torture in order to attract the spirits. The self-torture includes several days' fasting, cutting off pieces of one's flesh, and suspending one's self by thongs, fastened to pins which are driven through the aspirant's flesh.

No such customs are found in Asia. Voluntary self-torture never occurs. The aspirants indeed undergo tortures, but all of these are inflicted by spirits. They are undergone, not in reality, but in a dream or in a vision. The folklore of the tribes of Siberia abounds with descriptions of monstrous surgical operations undergone by young people doomed to be shamans at the hands of the spirits.

There is no voluntary quest of spirits in the shamanism of Siberia. Spirits themselves elect a man and compel him to become a shaman, mostly against his will, and his life is in danger in case he disobeys.

So an aspirant in Siberia is always passive. When a person gives way to the call of the spirits he is inspired with their power, filled with their substance and force. The shaman, indeed, is periodically obsessed by the spirits, but they do him no harm; they bring him supernatural force and surprising ability.

Tattooing 1880 – 1930s

Folder 1

C. Hart Merriam
Papers
BANC MSS
80/18 c

Dressed in Paint

The Arekunas of Brazil who inhabit the mountains and savannas on the sources of the Rivers Caroni, Cuyuni and Mazaruni

Their whole body including the hair was painted red with annatto whilst the face was painted in stripes and points with Caravera a color made from the Bignonia Chica, Humb and Bonpt.

Paint

The Australian tribes are
as fond of disfiguring them
selves with yellow and red
Pigments as our western
aborigines

Ballon

ANCIENT WATER COLORS.

Egyptian Aquarelles Three Thousand Years Ago.

From the London Daily News.

Some years ago there was a fierce controversy in the papers on the durability of water colors. Those who took part it, as well as everyone who is interested in the subject, should visit Dr. Flinders Petrie's exhibition in the Oxford mansions. In his recent explorations at Tel-el-Amarna, the city of Khuenaten, he discovered a fragment of wall paper in distemper or water color. The portion that has been least injured by contusion or abrasion is that where the two daughters, Meri-Aten and Mak-Aten, of Khuenaten are represented. According to Dr. Flinders Petrie this painting is as old as 1400 B. C., and consequently has now stood the test of time for nearly 3300 years, and yet the colors could not have had a much fresher appearance when they were first laid on.

This picture has been preserved under the mounds of an old city, and has received knocks and bruises, so that it cannot be said to have been kept under the best possible conditions. Still, the colors have survived, showing that water colors, if properly taken care of, do possess the quality of permanency.

The Examiner.
San Francisco
May 1, 1892

FOR THE FAIR SEX.

Interesting Items for the Lady Folks to Ponder Over.

INTERVIEWS WITH AUTHORITIES.

Effects That May Be Seen Most Any Time in Our Pursuit of Happiness if One Knows Just Where and When to Look.

Appended are a few notes which an EXAMINER reporter has made from interviews had during the past week which will be found of general interest to our lady readers:

FACE STEAMING AND IRONING.

How a Reporter Determined Its Scientific and Social Standing.

There is no subject that so interests the men as the means of treatment calculated to beautify the complexion of the ladies, the intense interest of the ladies being secondary or the result of men's desire. But how is the casual observer to determine which of the various treatments is the most deserving? How is one to decide between them without a great deal of observation or scientific study? It is just the same as it is with the physician or newspaper. A novice may at once select the leader by the unsolicited patronage controlled of the best and wealthier class of people.

It is thus that the reporter of the EXAMINER concludes that the Le Verite Toilet Bazaar, whose principal treatment is face steaming and ironing, is the most deserving or the least open to criticism.

In the parlors of this bazaar in the Donahue Building, at 1170 Market street, there may be seen any day a group of fashionable and wealthy ladies whose presence is unmistakable evidence of its superiority over all other treatments in existence; is unmistakable evidence that its scientific standing is equal to its high social status. This one fact when understood places this institution independent of the necessity of any pencil pusher's praise.

Tattooing Maoris of New Zealand.

Some of the Maoris still keep up the old hideous practice of tattooing, the men puncturing the whole face to increase their importance, and the women their lips, chins, and eyelids to increase their personal attractions.

A friend of mine told a married woman in Japan, that he wondered at her disfiguring herself by blackening her teeth!

"What do you mean?" was the indignant answer. "Any dog has white teeth."

Probably the Maori damsel thinks along the same lines, but

after looking at her slaty blue
lips I thought her mistaken.

The young women of the tribes
that are brought most in contact
with the whites, are giving up the
tattooing process upon their faces,
but those of middle age or old-
-der, are defaced by blue lines
about the lower lip, and the chin.

Ballou.

Tattooing
By The Ainu Females of Japan
Island of Yezo

The women are not so good looking as the men, due to the custom of tattooing their faces. Two parallel lines are drawn over and beyond the mouth and line made joining the eyebrows together. The coloring matter is dull blue and gives them the appearance of having an exceedingly dirty face, which is also often the case. Two long locks of hair are brought from the back of the head and passed round forward so as to prevent the front falling into the eyes. The rest is then cut short, about two or three inches below the nape of the neck. This is of itself very unbecoming, and when the tattooing is taken into consideration also, it will be readily understood that it would be difficult for almost any woman to look beautiful or even good-looking under these circumstances. The hands and arms are also decorated with geometrical patterns. When a little girl is five or six years old, a band is tattooed near the elbow. Every year another band or pattern is added until the girl is of age or marries. The women are beautifully formed; their figures being slender, lithe and supple, their carriage good and limbs well developed. Their teeth are strong, white and even, and are one of their most attractive features.

Arm of an Aino Woman

The Ainos have a hole in the roof for the smoke to escape, but there is a mat hung before it prevents the free exit. The root that collect on this mat is often used for tattooing purposes

California
April - 1892

INKS OF ALL COLORS.

TATTOOING.

One of the customs of the past ages, which is now going out of use almost entirely among civilized people, is that of tattooing, or marking the skin indelibly by puncturing it and inserting a dark coloring matter. The practice of tattooing arose among primitive peoples in many different ways. With some it was a mark which served to signify subordination to a chief, very much as farmers at this day brand their cattle. Among the Sandwich Islanders, it indicated the district in which the person lived. With many others it had a religious significance, and sacred emblems were marked upon the body.

Some superstitious service of the dead was evidently indicated in early Bible times by tattooing, for the book of Leviticus contains this command: "Ye shall not make any cuttings in your flesh for the dead, nor print any marks upon you."

Among other peoples, tattooing has been resorted to from sheer vanity; and the practice, so far as it has survived in modern times, has been the result of a mixture of vanity and superstition. Occasionally the "dime shows" and the "side shows" contain a tattooed man, some of whom were willingly marked over their whole bodies, while others were tattooed by their captors, when they were taken prisoners in savage wars.

At the present day, it is sailors and soldiers, among civilized people, who practise it, chiefly, and their arms and the backs of their hands are often decorated with anchors, shields, and all sorts of fantastic devices, or with religious emblems.

In Europe, workingmen frequently decorate their arms with entire sentences. Some one at the great iron works at Neuilly, France, has been observing the tattooed arms of the workmen, and has found upon them, among many other inscriptions and emblems, the following sentences, the first three being, it seems, very common among French workingmen:

"No luck." "Child of misfortune." "Thine for life." "Death to the unfaithful." "Born under an unlucky star." "Glory, honor, fatherland." "All for the fair."

There were also found many representations of clasped hands, and emblems of occupations, such as hammers, squares, compasses, or anchors.

Some extraordinary tattooing has been observed among the native recruits for the French service in Algeria. One soldier had tattooed upon his breast an elaborate picture of a lion-hunt, while his back was ornamented with a representation of a cavalry charge. As the process of tattooing is painful, the man who bore these works of art must have suffered greatly.

Many men who have had the backs of their hands tattooed in youth, and have at that time regarded the decorations as something to be very proud of, or who, as workingmen, have been proud to bear the emblem of their trade, have very earnestly wished, in reaching maturity, or in working their way to wealth or social position, that they might be rid of the marks which they took such pains to get. But the marks remain tenaciously, and indicate with almost perfect certainty that he who bears them was either a very foolish boy, or that his early life was passed among bad associates or in a menial occupation.

There are, however, fewer and fewer men who bear such decorations, and it is probable that tattooing will before many generations disappear altogether among enlightened people.

Sept 6-1888

A JAPANESE TATTOOER.

His Professional Talents Bring Him an Income of $6000 a Year.

[From the New York Sun.]

A Japanese tattooer of great skill and reputation has recently opened a studio in Hong Kong. He receives his visitors in a small office full of fans, screens, topsy-turvy pictures and sharp corners. On a big table in the middle of the room are pattern books. The visitor tells whether he wishes a humorous, pathetic, sentimental or religious emblem tattooed on his person, and, according to his answer, receives a volume of humorous, pathetic, sentimental or religious designs for examination. Most persons choose none of these designs because they are too expensive. The tattooing with representations of animals is the cheapest and the most popular. A butterfly costs but $1; three butterflies, $2 50; five butterflies, $4. A dragon, the most expensive animal, costs $25.

After the customer has chosen his design the tattooer leads him into an operating room, over the door of which hangs this notice: "I never work while I am drunk." The customer lies on a couch and bares the limb on which the design is to be done. The operator then pricks in the skin with fine needles the lines of the animal or scene ordered. He applies a little colored powder and a pinch of vaseline to the spot he has pricked and the job is done. He can prick three butterflies in about 40 minutes. The execution of a big dragon, however, occupies five hours. A day or two after the operation the skin about and above the design comes off and all the lines become clear.

The masterpiece of the Japanese tattooer is the representation of a little fan covered with human figures. This bit of tattooing adorns the forearm of a young English woman in Hong Kong. The operator himself hasn't an unadorned square inch of skin on his body. Snakes, birds, cattle, women, picnics, dinner parties and steamships in wild hodge-podge cover his back, chest, legs and arms. His income from his business is about $6000 a year.

INKS OF ALL COLORS.

How Writing Fluids Are Made in American Laboratories.

Ink is variously composed, according to the purposes to which it is to be applied. Common writing ink is the pertannate of iron, mixed with a little gallate, held in suspension in water by means of gum or some other adhering substance. The gum also preserves the ink from being too fluid and also serves to protect the vegetable matter from decomposition.

Blue ink has of late years been much in demand. The coloring matter is said to be sulphate of indigo and tincture of iron, or, according to another recipe, Prussian blue dissolved in water by means of oxalic acid. Red ink is usually made by boiling in the proportion of two ounces of Brazil wood in a pint of water for about a quarter of an hour, and adding a little gum and water. This ink is not in demand now, carmine having superseded it; this color is attained by a solution of carmine and ammonia, also adding gum. The great merit of our common writing ink is in the freedom with which it flows from the pen, allowing of rapid writing, and the manner in which it bites into the paper, so as not to be removed by sponging. The great defect is in the want of durability. Such inks partake of the nature of dyes. The writing ink of the ancients, on the contrary, is characterized by great permanency; its basis was finely divided charcoal mixed with some mucilaginous or adhesive fluid. India ink is of this character; it is formed of lampblack and animal glue, with the addition of perfumes, not necessary however, to its use as an ink, and is made up into cakes. It is used in China with a brush, both for writing and painting upon Chinese paper, and it is used in this country for making drawings in black and white, the different depths of shade being produced by varying the dilution with water.

"Writing ink," said a prominent manufacturer, "is now made in large quantities in New York, and whereas in the past we used to import largely, we now export to almost every country."—*N. Y. Mail and Express.*

THE ART OF DYEING.

1550

SOMETHING ABOUT WHICH BUT LITTLE IS POPULARLY KNOWN.

Less a Mystery Now Than in Olden Time An Advance in the Art—Discoveries in Chemistry — An Important Industry Colors.

But this is the age of color; and in noth ing else during the last thirty years has science made such a forcible impressior on the usages of domestic life as it has made through its contributions to the resources of the dyer. Go through the dry goods district and observe the win dows. Look into the carpet ware rooms the furniture ware rooms. or even into the gentleman's furnishing store. Every where the rainbow seems to have been caught and reproduced in fresh hues. The very flowers and fruits, though still beau tiful and attractive on account of their odor and flavor, have lost the transcend ing superiority in tints for which they were once noted, and must consent to be come only common contributors to an ocean of color, where every wave is a translucent marvel. According to M. Chevreul, the resources of the dyer now cover 15,000 chromatic shades. But after counting 14,999 shades it would have been just as well had this author stopped calculating and pronounced the remainder infinite in number.

This sudden advance in the art of dye ing has been due to the general cause that has contributed so much to civilization during the last hundred years. It has been due to the discoveries in chemistry. Through all the many centuries of history the world knew only of natural dyes, and down to the beginning of the present century, or rather till past the middle of this century, it still busied itself with the discovery of new natural agents. It had found indigo, cochineal, logwood, madder. quercitron bark, sumach, Brazil wood, and other vegetable or wood dyes, and it learned by various means to be more or less successful, by the use of chemicals in a process technically known as mordant ing, in making permanent the colors pro duced by these agents. But it had not learned to distill color from the elements. It could reach only the boundaries of an empire that was not yet quite won. Finally, the chemist Unverdarben discov ered aniline, a purely chemical agent, the distillation from coal tar. This discovery opened the way for an industrial revolution, which is perhaps even yet only in the infancy of its movement. This happened in 1826. But the utility of the discovery was not known until many years later. It was not until the year 1858 that the tint known as Perkin's purple, a product of aniline, followed soon afterward by aniline red, or Magenta became known. Then the revolution was fairly inaugurated, and since this latter date the advance has been rapid. All that is most brilliant in color is credited to this new chemical agent.

But the body of the art remains unchanged. What are technically known as the wood dyes have more substance and permanency than the aniline dyes. Indigo still forms the basis for blue. The scarlet on the coats of the British soldiery, warranted not to run, is mainly produced from cochineal; madder is the basis for crimson red and Turkey red, and yellow is produced by fustic, quercitron bark, or its concentrated extract, called flavine, and from Avignon or Persian berries. The mordants remain also unchanged. Chief among them is the oxide of tin, called tin spirits by the trade. This fixes the scarlet colors founded upon cochineal; but alum is used as a mordant for crimson red, and cherry red is produced with a tin mordant from ammoniacal cochineal. Turkey red is produced from madder on an aluminous basis. Thus ran the formula in the old art of dyeing, and thus it runs still. Aniline is rather a re-enforcement than an independent agent. Prussian blue, however, is purely a chemical product, and its discovery antedated the discovery of aniline colors.

But after the production of the simple or primary colors comes the production of the infinite variety of tints that go to make up the total used in the industrial arts. In this work the process of the dyer differs from the process of the painter rather in the means of execution than in the principles on which he works. Does the dyer wish to produce a green fabric? He may mix indigo (blue) with fustic or quercitron bark (yellow), handling at the same time the mordants in accordance with the teachings of the best experience, and the result will be the desired color. Does he want orange? The dyes that produce yellow and red will give him an orange fiber, and by the same process of combination he may have purple, violet, mauve, gray, drab, black, or any one of M. Chevreul's 15,000 chromatic tints. But he should be a man with a trained eye, and a person who is color blind will hardly make a dyer.

REMARKABLE SAVAGES.

From Cannibalism to Citizenship in Only Fifty Years.

From the National Geographic Magazine.

The Maoris are in many respects the most remarkable savages with whom the white man has come in contact.

Fifty years ago cannibalistic feasts, at which the flesh of their fallen enemies was served were not uncommon. Today several members of their race are members of the New Zealand parliament, and Maori women, as well as the white women of New Zealand, exercise the right to vote.

When the English first occupied the islands, in the early part of the nineteenth century, it is estimated that there were about 100,000 Maoris in New Zealand. They were divided into tribes, each having its own unwritten laws regarding land, cultivation and other social matters.

The English found that they had a genius for war, showing unusual ability in building, fortifying and defending stockades, and they experienced considerable difficulty in subduing them.

The Maoris were also skilled in several arts: They tilled the soil with great care; as carvers and decorators they were unrivaled in the execution of rock paintings and in carving the ornamental figures of their dwellings, their boats and sacred inclosures.

But the Maoris were also noted for their remarkable tattooing, which was designed to clothe as well as decorate the body. The Maori artist knew how to give endless variety to the curves of his drawings; the natural furrows, the movements of the countenance, the play of the muscles—everything was made to enhance the charm of the design, and a hale young man certainly presented a fine sight, draped only in this delicate network of blue lines on the ruddy brown of his skin.

Whoever refused to undergo the protracted tortures of tattooing required at every important event of his life was regarded as a person by his own consent foredoomed to slavery. The men were actually depilated in order to increase the surface to be covered with ornamental tattooing, while for young women the operation was limited to the lips, whence the term blue lips applied to them by the English.

There are about 35,000 Maoris left. These have retired to the northern provinces of New Zealand, where certain reservations have been set apart as their exclusive property.

Schools have been established which the Maori children attend regularly. It is said that such of them as continue into the higher branches of learning are worthy rivals of white students. Some of the Maoris have become large landed proprietors; they are proud of their right to vote, and especially of the fact that their women obtained this privilege at the same time that it was given to the white women of New Zealand, in 1893.

N. Y. Herald
Sept 15 1912
4

WARRIORS' HEADS NEW MUSEUM GEMS

Embalmed Trophies of Maori Battles Form Realistic Display Just Received.

FACES FINELY TATTOOED

Exhibits Are Considered Very Valuable, as British in Recent Years Have Prevented Hunting of Heads.

Startlingly realistic is the display of human heads once the adornment of the shoulders of Maori warriors and yesterday placed on view in the American Museum of Natural History. For those who like that kind of thing it may be said that the collection is the largest and best in the world, for it contains thirty-five specimens, which is five times the number in the next largest assemblage.

All these heads were obtained at a considerable expense and were presented to the institution by a gentleman whose benefactions have already been extensive. To the anthropologist they are invaluable.

It was once a custom pleasing to the Maoris to line up for what may be called a head rush which resembled a football scrimmage reinforced with battle axes and long knives. The women and children acted as quarter backs and when a head was obtained it was given to them. One of them then ran around the end with the grewsome trophy and hid it in the woods.

All the Maoris paid much attention to tattooing, and the price of a head was greatly enhanced by the decorations which it bore. Some of the chieftains even spent much time in overseeing the facial decorations of slaves who later appeared in portrait galleries over the abode of their masters. Tourists visiting New Zealand in the old days often purchased a head or two to take home with them, and this greatly enhanced the prices and also caused truly strong men to specialize in the fine art of murder.

Officers of the British government put a stop to the practice entirely, and the heads which may now be obtained are of no very recent period. They are elaborately tattooed, although after the prices went up it was as much as a man's life was worth to have any adornments out of the ordinary on his cheeks. The specimens are in a marvellous state of preservation, for the Maoris had a secret method of embalming or curing the heads which prevented withering of the features and kept the tattoo marks intact. From the viewpoint of the scientist the collection is considered a notable one, and it is being carefully examined and catalogued.

"Such a manly boy," she said, ...
about it afterward. "Why, he was more thoughtful than most boys I know who have had the advantage of associating with gentlemen all their lives."

THE CARDBO...

On a square piece of cardboard draw twelve apples as shown in the illustration. The trick is to cut the cardboard into ...

THE TIGER LILY.

BY MAY EAGAN.

Long years ago in Flowerland
There dwelt a lily tall.
She held her head in scornful pride
Above the flowers all.

"Indeed, I soon shall marry
A fairy prince so fine,"
She often said, with regal air,
"And then all things are mine."

The flowers shook their pretty heads;
Such thoughts were great, forsooth,
But seldom had a flower wed
With such a fairy youth.

One day a tiger, regally dressed,
...

ONLY TATTOOED ROYAL LADY.

Princess Waldemar of Denmark has a large anchor tattooed on her left arm. It was done in the far east when the princess, then Marie of Orleans, was making a long tour of the orient. To enliven the monotony of life aboard ship the princess and her companions were tattooed by a Japanese sailor. The princess has a reputation for unconventionality that amounts practically to eccentricity, but she is one of the richest women in Europe and can afford to be independent.

Sudanese upper arm
Tribal marks

Tribal Marks.

I am surprised at how many of these people have scars on their faces. Nearly every other man I meet has the marks of great gashes on his cheeks, forehead or breast, and some of the women are scarred so as to give the idea of terrible brutalities having been perpetrated upon them. As a rule, however, these scars have been voluntarily made. They are to mark the tribe and family to which their owners belong. The mamour tells me that every tribe has its own special cut, and that he can tell from just where a man comes by such marks. The cuts are of all shapes. Sometimes a cheek will have three parallel gashes, and at another time you will notice that the cuts are crossed, while at others they look like a Chinese puzzle.

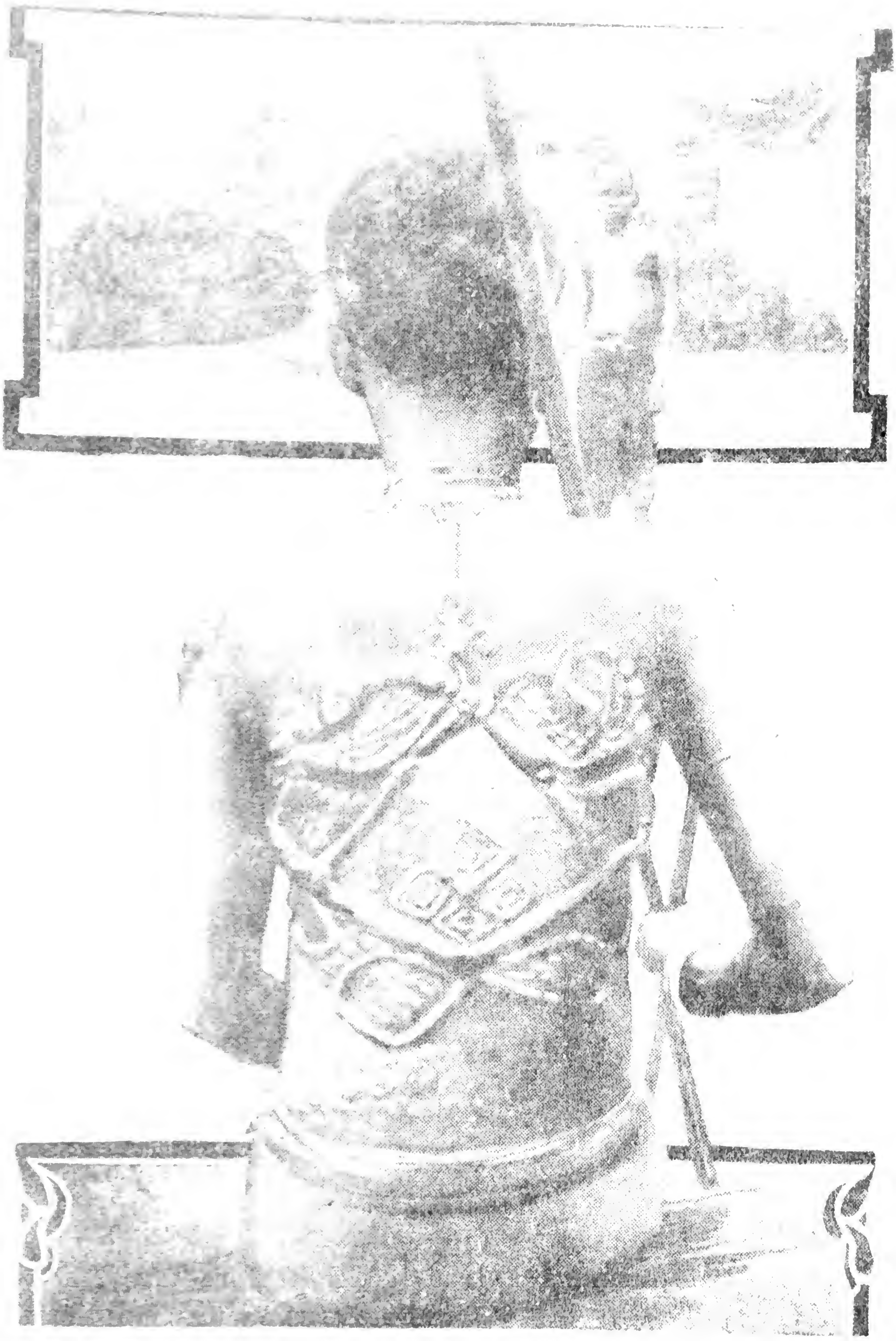
The dress of the people is strange. Those of the better classes wear long gowns and are clad not unlike the Egyptians. Many of the poor are almost naked, and the boys and girls often go about with only a bert of strings at the waist. The strings are like tassels, and they fall to the middle of the thigh. Very small children wear nothing whatever.

Many of the women wear no clothing above the waist, and they seem to have no false modesty about the exposure of their persons. I saw one near the ferry as I landed this morning. She was a good-looking girl of eighteen, as black as oiled ebony, as straight as a string and as plump as a partridge. She was standing outside a mud hut shaking a sieve containing sesame seed. She held the sieve with both hands high up over her head so that the wind might blow away the chaff as the seed fell to the ground. She was naked to the waist, and her pose was almost exactly that of the famed "Vestal Virgin" in the Corcoran Art Gallery at Washington.

This Carved BACK a Beauty SIGN.

THAT fashion rules the world is as true of the people who dwell in the remote corners of the earth as of those whose lot has placed them in the brighter light of an advanced civilization. No matter how much discomfort attends the following of any established custom, it never fails to have its votaries. A striking example of this is found among the natives of the Congo Free State, where the women in lieu of clothes or ornaments to add to their physical attractions submit to a process known as "back-carving" that is attended with a great amount of suffering. The process is a tedious one that commences when the girls are quite young. Small pieces of wood whittled round and pointed so as to pierce the cuticle are first inserted between the shoulders and the waist, and must be kept there until the skin will stay in the raised condition they compel. Larger sticks follow the first ones, and a pattern of any design that the older women may be able to invent is worked on the back of the young sufferer.

This Carved BACK a Beauty SIGN.



TATTOOING dates back so far that it is impossible to discover when it was first practiced, but it was one of the practices that were prohibited to the Jews, for in Leviticus xix, 28, is the following: "Ye shall not make any cuttings in your flesh for the dead, nor print any marks upon you." From this it may be inferred that tattooing was prevalent among the tribes in the days of Moses. It is a custom that prevails among the savage nations of the earth, and tattooing is practiced to this day except where Christianity and civilization has put a stop to it. It was at one time years ago, and is yet, but not to such a marked degree, a fad among sailors to have various designs placed on the body. It was also a fad among a certain class of silly women to have their lover's name tattooed on the arm or breast. There are sailors in almost every seaport at this time who are willing for a consideration to place figures on the flesh of any who are foolish enough to have disfiguring marks driven beneath the surface of the skin with needle points dipped into coloring matter.

Baltimore Sun
July 13-1894

THE ORIGIN OF TATTOOING.

It Dates So Far Back That It Is Lost in Antiquity.

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Hotel Gazette Apr 30. 1895

Tyrian Purple

Tyrian purple of ancient times, above referred to, that in the reign of Augustus one pound of wool dyed with it sold for about $170. This is not surprising, inasmuch as four pounds of the liquor from the mollusk used were required for dying a single pound of wool. Thus the rich Tyrian fabrics were worth their weight in gold. The secret of this dye was lost for centuries and its rediscovery in modern times has not been used, owing to the finding of the value of cochineal and coal-tar colors for similar purposes.

So precious was the

The beautiful dye known as Tyrian purple was formerly procured from a sort of mollusk, the coloring matter being obtained from a single vein in the back of the animal. Sepia is the dark fluid [redacted] bag of the cuttle fish. The gall of the carp is used in Turkey as a [redacted] paint and for staining paper.

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Green Paint

The gall of the Carp is used in Turkey as a green paint and for staining paper

TATTOOING.

Staff Correspondence of The Republic.

New York, Oct. 17.—The tattooed men seen in dime museums throughout the country have nearly all of them been operated

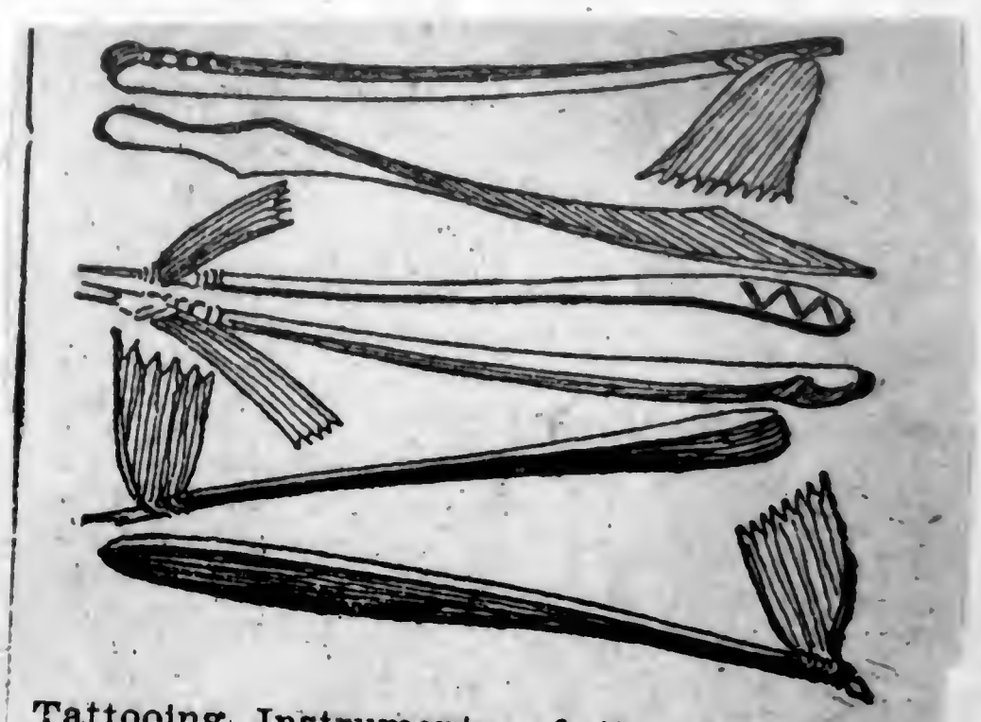
John Rutherford, First Tattooed Man.

on by a Chatham Square specialist in New York City, who has probably tatooed more persons than any man living. There is scarcely a man-o'-warsman anchors in the bay that doesn't send its quota to "Prof." O'Reilly, and with these and museum people he is kept busy.

His prices are very moderate, ranging from 75 cents to four or five dollars, according to the amount and delicacy of the decoration. When one submits himself to the skillful hand of the professor he selects a design out of three or four thousand, and within 30 minutes the work is completed, the ink is in the skin and can never be removed.

O'Reilly tattooes by electricity. A number of fine sewing needles are fixed firmly in a block of wood. This is attached to a sort of trip hammer, which is run by an electric battery. O'Reilly never traces the figure beforehand; he simply looks at the design, dips the needles in India ink, places them in the arm or breast and presses the button. The hammer plays on the skin with sufficient force to puncture it effectively, but not enough to draw blood. The sensation is rather tickling than painful. There are no after results, not even swelling.

Rutherford, an English navigator, with his comrades was cast ashore on the island of New Zealand a number of years ago. After various ceremonies, he says, "the whole of the natives having seated themselves on the ground in a ring, we were brought into the middle, and, being stripped of our clothes and laid on our backs, we were each of us held down by five or six men, while two others commenced the operation of tattooing us. Having taken a piece of charcoal and rubbed it upon a stone with a little water until they had produced a thick liquid, they then dipped into it an instrument made of bone, having a sharp edge like a chisel and shaped in the fashion of a garden hoe, and immediately applied it to the skin, striking it twice or thrice with a stick of wood. This



Tattooing Instruments of the New Zealanders.

made it cut into the flesh as a knife and caused a great deal of blood to flow, which they kept wiping off with the side of the hand in order to see if the impression was clear. When it was not they applied the bone a second time to the same place.

"They had also sharks' teeth of various sizes, which they used in different parts of the work. While I was undergoing the operation, though the pain was very acute, I neither moved nor uttered a sound; but my comrades moaned dreadfully." It took them five hours to tattoo Rutherford, and for three days he was totally blind, owing to the swelling, and it was six weeks before he was completely well. The rest of his comrades died from the effects of it.

So superior is the work of the Japanese

St Louis Republic
DEC 4 - 1894

Palmelline.

THIS is a new coloring matter recently obtained, that appears to possess some peculiar properties. The red alga, *Palmella cruenta*, growing freely near damp walls, when carefully dried in the air, is digested in a small quantity of water in a covered porcelain vessel, when a coloring matter dissolves out in about twenty-four hours, and may then be decanted as a fine rose-red liquid, showing an orange-yellow by reflected light. This coloring matter is reported to bear a singular resemblance to the coloring matter of blood or hæmoglobine, and like it, is insoluble in alcohol, ether, benzine, or bisulphide of carbon, but dissolves readily in water. Like blood, it may be coagulated by heat, acetic acid or alcohol added to its watery solution; it likewise readily undergoes putrefaction at summer heat. Under spectrum analysis it is found closely allied to blood, while, like blood, it also contains iron. The brilliant color of palmelline seems likely to make it valuable as a dye or stain.

Scribners Dec 1889

TATTOOING IN BURMAH.

How It Is Performed—Opium as an Anæsthetic—Designs.

Of all Burmese customs, one of the most singular is that of tattooing the person, from the waist to below the knees, with figures in black ink. Every man in the country is thus adorned, and unless his skin be unusually dark, he looks at a little distance as though he were clothed in a tight fitting pair of knee breeches. The custom is said to be falling into disuse, but I have seen very few Burmans without this "mark of manhood," which is conferred upon him when he is about 12 to 14 years old. The operation is a painful one, and I was glad of the opportunity that now offered to see it, though aware that it takes at least two or three days to complete.

Pho Myin, the subject, is lying on a mat quite nude, with a dazed look in his half closed eyes, and breathing heavily. Moung Daw nods at him meaningly.

"He has taken much opium," he says, grinning to me.

I am not surprised at it. If the Htokwinsayahgyee was going to exercise his art upon me for four or five hours, I should follow the Burman's plan and take opium by way of an anæsthetic.

The tattooing will show well upon the plump, fair skinned lad before us, and the professor evidently thinks he is a subject to take pains with, as he sits carefully mixing his ink in a joint of bamboo and preparing his weapon. This is a brass rod nearly two feet long and about half an inch thick; it is weighted at the top with a little ornamental figure, and at the other end has a hollow point divided by two cross slits into four fine pricks. The professor examines the "business end" critically, and, having satisfied himself that it is sharp enough, tucks up his putsoe and squats at Pho Myin's side. Selecting a spot on the thigh, he places both feet on it a few inches apart, and stretching the skin tight, draws the outline of the first figure—a tiger rampant—with an inky splinter of bamboo; this is soon done, and relieving himself of a large mouthful of betelnut, the professor settles down to work in earnest. Leaning forward through his widely parted knees, he balances the brass style daintily, and, clasping it with the finger and thumb of the right hand, makes a "bridge" of the left, which he rests on the surface between his feet. After sliding the instrument through his fingers once or twice, as if to take aim, he makes a start and pricks away steadily with a light firm touch that is wonderfully quick and true. In less than five minutes the tiger, with its surrounding border, is finished, and the artist removes his feet from the distended skin, and washes off the superfluous ink to see how his work has come out. Everybody presses forward to look at the picture, which shows up in bold relief on the rapidly formed swelling. Moung Saik exchanges a remark with his wife, and the tattooer resumes his working position to draw the outline of the next figure.

The boy, stupefied with opium, lies insensible to the pain, while one figure after another gradually appears on his skin. Deep as the points of the style sink, they draw little blood, but the limb swells in a manner that would alarm any one who did not know it would return to its normal size in a day or two. Fever sometimes intervenes, and in that case the patient waits for a time before the work of illustration is resumed, so it often extends over a period of a week or ten days, during which the inconvenience suffered is considerable. Without the aid of opium the process would be a much longer one. I found that I could not endure the application of the style for more than thirty consecutive seconds without flinching so much as to interfere with the operator's movements; for the skin is pricked over so closely that it becomes too tender to sustain their repetition.

Eight rupees is the usual fee paid to a tattooer for endowing a lad with breeches. The figures that compose them vary little, consisting as a rule of tigers, "nagas" (dragons) and "beloes" (devils). Each one is surrounded with a border of sentences, generally illegible, invoking good luck upon the owner of the skin whereon they are inscribed. The waist and knees are neatly finished off with a tasteful edging of point or scroll pattern; these sensitive parts of the body are the last to be done, and tattooers have told me that the pain caused frequently arouses the patient from his torpor.—Cornhill Magazine.

Dyeing is one of our most important industries, employing in New York alone nearly 3,000 men, at wages averaging about $18 a week. It does not belong strictly to the process of manufacture, as commonly supposed, but it is a separate art. It may be easily seen, too, that there is no other industrial art where there is more likely to be a marked difference in the capacity of different workmen. First, there is demanded the accomplishment of knowing the mechanical process to perfection. It is an operation that must be timed to a nicety, as the best results may be lost even at the moment of fruition. Then, again, no man can ever become a good dyer, no matter what the length of his training, who is in any way defective in his sense of color. In a certain sense the dyer is a professional colorist, and though dyeing is usually done in the skein, and much of the beauty of the finished fabric is due to the taste for combination in the designer of patterns, the dyer has his share, and a very large share, in the success of the work. It is the advance in the art of dyeing that makes the chief superiority in the coloring of the more modern goods, and not the advance in the art of combination and design.

Were the subject of dyeing to be treated broadly it might be made to include other arts besides the art of dyeing textile fabrics. Other material may be made to receive coloring matter in a manner to change its appearance as completely as the appearance of these fabrics is changed. The endolithic process in the treatment of marble furnishes an instance. Marbles subjected to this process are as completely dyed when it is thought worth while to change the entire substance, as a skein of silk, and made to imitate perfectly the product of any ancient or modern quarry, or to absorb pictures. But this is not credited to the dyer's art and stands as a distinct discovery, with only the antiquity of a few years to make it venerable. The true dyer can trace his lineage back almost as far as the shoemaker.—New York Sun.

Fruit of the Huitoc
dark blue — Indians
paint their bodies & stain teeth

Fruit of the huitoc: This is a round fruit, the size of a large peach, the juice of which stains a dark blue. The Indians paint their bodies in fanciful devices with it and stain their teeth. They also cover their arms and legs with it as a protection against musquitoes.

Valley of the Amazon
National Intelligencer
Lt Herndon July — 1852

Maori Female Prefer
her Native Adornments To Foreign
Frauds Paint

Her Simple Tastes.

Beautiful as the Maori Rakope undeniably is, she commonly dresses in a calico frock—and nothing else unless it is a straw hat. Her flounces and ribbons are not always new or fresh when she is costumed in the latest Auckland modes for church. If she dons silk stockings and tight slippers for the dance she does so with infinite pain and kicks them off at her earliest opportunity to smoke a comfortable black pipe with some of the ugliest of the old women of her tribe, and, moreover, in her home, which is smoky beyond the peradventure of a doubt, probably smelly, possibly dirty, she commonly wears nothing more than an old native blanket and would feel not the slightest shame were it to slip to the ground before you. For she is a child of nature and free from artificial standards, like one of nature's fearless and splendid animals.

Maori nature does not change. The acquired veneer of European civilization is at best but skin deep, and the girls, one and all, still treasure the native tufted blankets and the trinkets of polished greenstone, dogs' teeth, boars' tusks, polished shells and feathers, in which my friends delighted to be photographed. But with all this the Maori girls possess so undeniable a charm that not even the lines of tattooing that still ornament the chins of some of them, though the practice is no longer a common one with this generation, can spoil it. It is said that one or two Maori belles have married titles. One is curious to know how old age will treat them, for it is then that Maori women deteriorate into the most hideous of creatures. Whether that may be the result of the hard and ungrateful lives they live in New Zealand and might be modified by quite another sort of existence is a problem that I have never seen demonstrated.

In the old days Maori chiefs and freemen were permitted to have several wives, and the possession of a suitable assortment was supposed to indicate dignity and greatness, the mother of the first born ranking as head wife, the others remaining little better than slaves. As a rule, there was no distinctive marriage rite. Girls as they grew up bestowed favors on whom they pleased and the more suitors they had the more valuable were they accounted. When a girl had a preference for one suitor the matter usually ended by her going home with him and the two lived as man and wife.

Among The Maoris. New Zealand
Jan Nov 19-1900

MAORI GIRL WITH FACE TATTOOING.

MAORI GIRL WITH FACE TATTOOING.

MAORI GIRL WITH FACE TATTOOING.

Muscles Bound by Wire.

The men carry curious little boxes of pandanus fiber to hold tobacco or betel, and on their arms and legs they wear bands of wire, which, having been fastened upon their limbs tightly in early childhood, produce an artificial deformity. They are never taken off, and the wearers believe that they give strength. The whole body is tattooed, though this custom is not so general as among the Igorrotes of the eastern mountain chain of Luzon. An extremely sharp piece of bamboo is used for the purpose, the designs being invariably in straight lines. The other wild tribes of the Philippines carry lances and shields, but the Negritos use no weapon save the bow and arrow, with which they are remarkably dexterous.

They are absolute nomads, having no fixed abiding place, and spend their lives in wandering through the dense forests in small groups or families, sleeping wherever night overtakes them, under the shelter of some tree, in any cave or hollow in the ground that offers, or in a hut built of four sticks and a few palm leaves. Such huts are of peculiar construction, the framework consisting of four delicate poles six feet high, fastened together at the angles, the top and sides being covered with palm leaves, while at a height of two feet a floor of very small poles is laid. To keep off mosquitoes in hot weather, and as a defense against cold during the more inclement season, a smoldering fire is maintained beneath the house, which literally toasts the occupants. For food they depend chiefly upon game, but when hunting is unsuccessful they eat various tubers and the pith of certain plants. Wild hogs, monkeys, and deer are among the animals which contribute to the pigmy larder.

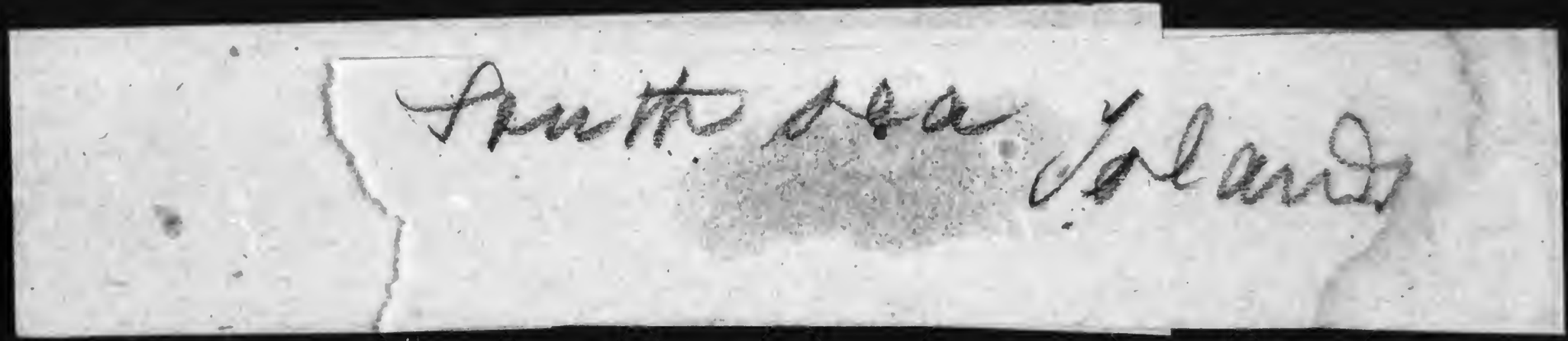
These little people of the forest are very timid, and commerce with them is only practicable by "deposit." That is to say, the purchaser of their goods places in a certain spot, mutually recognized for "shopping" purposes, a given quantity of a certain article—perhaps some bright-colored cloth or a few small looking-glasses. In return the dwarfs deposit what they understand to be wanted, and it may be taken away at leisure. A meeting between buyer and seller is not required. In this way the Negritos sell skins of birds, rare plants, honey, some gold, but most particularly wax. This last product was formerly bought in large quantities by the priests in the Philippines to make candles for the churches.

Post June 26-1900

Ancient Peruvians Ladies Painted their Faces

In one place Mr. Dorsey found the body of a girl. With it was a double wooden box which contained bits of pigments. Examination of the skin of the face shows that the young lady of that day painted.

St Louis Globe Democrat
Aug 5 1893


Santa Ana Island

AMONG ANTHROPOPHAGI.

Father Florent's Thrilling Experiences in the Marquesas.

EXILED FOR THIRTY-EIGHT YEARS.

Heroic Efforts at Establishing Missions—Translated Many Books—Going to Paris to Publish a Big Dictionary.

Among the arrivals here by the barkentine Tropic Bird was the venerable Father Florent of the Brothers of the Sacred Heart. He was one of a band of five heroic priests who thirty-eight years ago left Paris to labor among the cannibals of the Marquesas.

The venerable father has not been home in all that time, nor has he set foot off the islands. He has learned all the languages and dialects of the people of the thirty-five islands comprising the group and has aided materially in converting many of them to

A TATTOOED CHIEFTAIN.

Christianity. The reverend father told about the natives yesterday at length.

He said that of the five young priests, full of buoyancy and confidence, who left Paris in 1853 only himself and Father Nicolas were yet alive. He is sixty-six years old, he said, and Father Nicolas is seventy.

FATHER FLORENT TELLS OF HIS WORK.

"I would be there still," said the venerable man, "but I have been called to Paris to superintend the publication of a very large dictionary, which I am now getting out. I have made several translations of the Bible and of different religious works in the native tongue. When we went to the Marquesas there were no missionaries there. Disease has swept away more than half the population since my arrival there.

"Then there were about 12,000 natives. Now there are not more than 5,000.

My home in the Marquesas has been nearly all the time at Taiohae, on Nukahiva island, which now has two general stores. Nine of the brothers of the Sacred Heart are there.

"When we arrived the natives were cannibals and our lives were not safe. Several times the natives resolved on massacreing us, but in some manner we always received word of it and escaped.

"The natives had no conception of firearms, never having seen or heard of any. They fought with clubs, bows and native spears, with all of which weapons they were very perfect.

CUSTOMS OF A STRANGE PEOPLE.

"One of my hardest efforts was to get them to cease from tattooing themselves. The men oftentimes tattoo themselves from head to foot, there being hardly an inch square of the surface of their skin anywhere from the forehead down not tattooed. Oftentimes the body at a little distance seems of a blue color owing to the use of the dyes.

"The women of the higher order as a rule do not tattoo themselves except on the hands and forearms. The face is left perfectly clear, and handsomer women than some of the Marquesas I have never seen. They are amiable, too, and have naturally many qualities that are most admired in the women of civilized countries. Their features are very regular, their hair as black as a raven's wing, their eyes dark brown or black and their complexions of a butternut hue. Some, however, are nearly white.

"When I first went there two of the most formidable tribes, the Hoppahs and the Taeehs, were at war with each other. They are among the bravest and bloodiest of the Marquesas. At about this time Captain Porter, since the noted American admiral, made his famous cruise in the Essex. He opened trade with the two tribes and persuaded them to cease their warfare. It was not without a great effort, however, and then afterward war broke out again.

THE NATIVE WOMEN AND THEIR FADS.

"One of the most noted descendants of Gattanewa, the potentate and ruler at that time, is Pittenee, now about forty-five years of age. She is yet beautiful, but then I thought she was the most beautiful young woman I ever saw. You understand the natives in that hot climate mature much

A PRINCESS OF MARQUESAS.

earlier than they do in the north. She was and yet is fairer than any woman of these islands I have ever seen. Her composure is dignified and she is stately and exceedingly graceful in appearance.

"Many of these natives, though but a degree moved from cannibalism, have a gravity, composure and courtesy of manner that is astonishing. It is natural to them as the dignity and composure of the American Indians was before their contamination with the border people. The skin of the women especially is remarkably soft and smooth, being kept so by applications of cocoanut oil. The women are fond of ornaments, and in late years they like to put on gorgeous colors.

"A more interesting people I do not think it possible to find anywhere. Feathers and flowers are fads with them. They also frequently wear necklaces of beads, wild cucumbers and red wild berries. Eardrops of hogs' and whales' teeth, fish bones and shells are also used in profusion among them.

"The men are uniformly darker in complexion than the women. Only those who are distinguished by rank and venerable in age are perfect in their tattooing. An old man who has been tattooed all over and bedaubed with cocoanut oil for years looks like a piece of old mahogany more than anything else. The innumerable tattoo marks run in waves similar to the grain of ancient well kept furniture. The operation of tattooing requires almost a lifetime to perfect it. It must be kept up for twenty-five years at least. It is begun usually at about eighteen years of age.

THE ISLAND'S FOREIGN ELEMENT.

"One of the most perfect instances of tattooing is found in old John Howard of Nukuhiva island. He is an American, has lived there over forty years, and has several native wives and a large family. He seems perfectly contented with his lonely life on the island. There are few Americans in the islands. What Europeans there are are largely French. Everything there is under French rule, and as good order is preserved, I presume, as it could be possible under the existing condition of the natives.

"I have great hopes that the long years myself and brother have spent there will not be in vain. It takes a long time to rescue people from such a state of barbarism as that in which we found them, but I think we have succeeded as well as it could be possible under the circumstances. The natives are now disposed to listen to us, and we feel that our labor is not lost.

"One of our great aims has always been to instruct the children. Our schools have been well attended, and though we have oftentimes seemed to make progress very slowly, we have really advanced as fast as possible with such a people. In saying this I do not wish to reflect upon them, for I consider them intellectually, and so far as their disposition is concerned, to be in the front rank with the people of the earth.

THEIR CANNIBALISTIC PREDILECTIONS.

"One thing I wish particularly to refer to is the habit of cannibalism. For more than a dozen years after I went to the islands as a missionary bands of natives known as anthropophagi, or man-eaters, used to make inroads on others with which they carried on intermittent war, steal upon and kill or take captive and carry them away to the jungles and eat them. Captives in war were eaten and band preyed upon band.

"Human life was at no time safe. One of our first efforts was to show them the horrible nature of cannibalism. Our teachings for a long time had little effect. Sometimes a band would come from the woods at night right where we were and steal away men and eat them. On one occasion we had to run for our lives and for five days we had nothing to eat but cocoanuts and bread fruit.

"Two years later they swept down upon us and carried away our native interpreter and two other natives. We never saw them again. Periodically afterward for several years we had narrow escapes. For several years they have come to understand that we were there for their good solely. We did not ask them for money, and they saw that our labor was entirely in their interest. You hear now and then of cannibalism on some of the remote islands, and I suppose at times it is still practiced, but always very stealthily. The habit may now be said to

ONE OF THE ANTHROPOPHAGI.

have about ceased. There are isolated cases, but only such."

Father Florent is bronzed almost to the color of mahogany by his long years in the South Pacific. His hair and venerable beard are long and as white as snow. Yesterday for the first time in thirty-eight years he walked about and looked at a great city. He saw the magnificent streets and the fast-moving cars, and shook his head demurely.

"This all belongs to another age, it seems to me," said the old man.

Father Florent said that now the great object of his remaining years was to finish the big dictionary on which he had been at work since his arrival in the Marquesas. He would be a year in Paris, he said, and then, if his health had not utterly failed him, he would return to the lonely, but pretty, tropical island of Nukuhiva, there to die with the strange people with whom he had labored so long.

Examiner San Francisco
Sept 19 - 1891

Jalisco

Cafe del pais Cassia Lœvigata

Cafetero Coffea Arabica

La naturaleza Vol 4 P. 33 - Mex. R.

TATOOING IN NOBLE CIRCLES.

Fashion Usurping the Old Monopoly of Barbarism.

(From the Boston Journal.)

It is said that the most popular pastime at present among the fashionable "leisured world" abroad is tattooing. That which was once the monopoly of savages is now fashionable—so, at least it is asserted—in the noblest circles.

If the titled world of fashion abroad never did anything less sensible than this they might well be excused. Our barbarian ancestors many centuries ago, instead of being at the expense of fashionable tailors simply painted their skins. It may possibly be some primeval taste that moved the Grand Duke Alexis of Russia some months ago to have himself elaborately tattooed. A current English magazine is authority for the statement that Prince and Princess Waldemar of Denmark, Queen of Olga of Greece, King Oscar of Sweden, the Duke of York, the Grand Duke Constantine, Lady Randolph Churchill, with many others of royal and distinguished rank, have submitted themselves to the artist's tattooing needle.

Although this kind of beauty is but skin deep, it serves many uses. The noble gentlemen and ladies who are tickled with the artist's needle may yet get strayed or stolen, as well as common folks, and need identification. Why should one be ever seeking, too, for beauty when it is just as easy to carry it along with him. It is said that Prof. Riley, a noted English tattoo artist, is at the present time engaged "etching" on a man's back Landseer's famous picture, "Dignity and Impudence," and when finished it will measure 12 by 9 inches. The same artist is also outlining on the chest of a Scotch baron a copy of Constable's famous etching, "Mrs. Pleham," after Sir Joshua Reynolds, the original etching of which was sold for the record sum of £425.

Young American heiresses visiting Europe this summer need not be afraid to imitate the distinguished English duchesses and countesses who are said to appear at rare functions with brilliant butterflies tattooed on their shoulders. One noble lady is said to have a Chinese dragon on her neck, and an American beauty decorated with the American eagle in this manner might possibly carry off the highest social honors and have a screaming success generally.

Times June 13 1894

embroidery, darning, and knitting needles, or 38 per cent more than she exported in the same time of 1899. The best customers were China, with 56.7 per cent; France, Austria-Hungary, and British East India, with about 4½ per cent each; etc.

American Bank in Rotterdam.—Vice-Consul-General Hanauer writes from Frankfort, under date of November 10, 1900, that an American bank has just been organized in Rotterdam, with a capital of 20,000,000 florins (about $8,000,000), of which 6,000,000 florins are paid up. The institution has for its aim the advancement of American trade, and bears the Dutch name "Deposito en Administratie Bank."

Consular Reports Transmitted to Other Departments.—The following reports from consular officers (originals or copies) have been transmitted since the date of the last report to other Departments for publication or for other action thereon:

Consular officer reporting.	Date.	Subject.	Department to which referred.
M. H. Twitchell, Kingston, Ontario.	Oct. 31, 1900	Crop report	Department of Agriculture.
W. M. Osborne, London	do	Report of hop crop	Do.
L. L. Stang, Saigon	Sept. 27, 1900	Report of rice market	Do.
Do	Oct. 11, 1900	do	Do.
O. J. D. Hughes, Coburg	Nov. 11, 1900	Chicken cholera	Do.

June 1901

Kansas has developed a new industry. At Concordia, Mrs. Lottie Clark has for four months been undergoing a process of tattooing which makes her the most tattooed woman in the world. She has 185 designs on her body, including a picture of the battleship Maine and a picture of the head of Christ. She hopes to make a fortune as a living curiosity.

The bodies of both
sexes are more or less
elaborately tattooed in
blue — Samoa Islands

Ballou

UNITED STATES DEPARTMENT OF AGRICULTURE,

SEED LABORATORY, DIVISION OF BOTANY,

WASHINGTON, D. C.

This is the only work I could find with a hooped search

Barnes

Tark a vegetable dye
stuff is used by the
natives of the Caroline
Islands to dye their
bodies and clothing

San Francisco Chronicle.

August 7, 1892.

ORIENTAL TATTOOING.

A Japanese Who Is an Expert Artist.

Wonderful Work Done by Hori Chio.

Some Remarkable Specimens in This City — Pictures Upon the Prince of Wales.

Written for the CHRONICLE.

Albert H. Geffeney, the Japanese interpreter of the United States Immigration Bureau in this city, has upon his arms the finest specimens of the tattooer's art that ever came to San Francisco.

The tatooed man or woman of the dime museum may possess more covered surface, but never do they have such artistically executed and intricate designs upon their atatomy as those which adorn the arms of Mr. Geffeney. Then, too, theirs are frequently fakes, but this is warranted to be fast coloring and not to fade or crock. People who have always beheld the crude butchery of Indians and sailors, wherein they use the wearisome anchors of fate or tombs embowered in distorted and painful weeping willows, have a right to regard with horror such a relic of barbarism. They have never seen tattooing as a genuine art, as a profession wherein none but a finished and original artist can excel and produce the wonderful designs which adorn, besides Mr. Gaffeney, some of the most prominent people of the world.

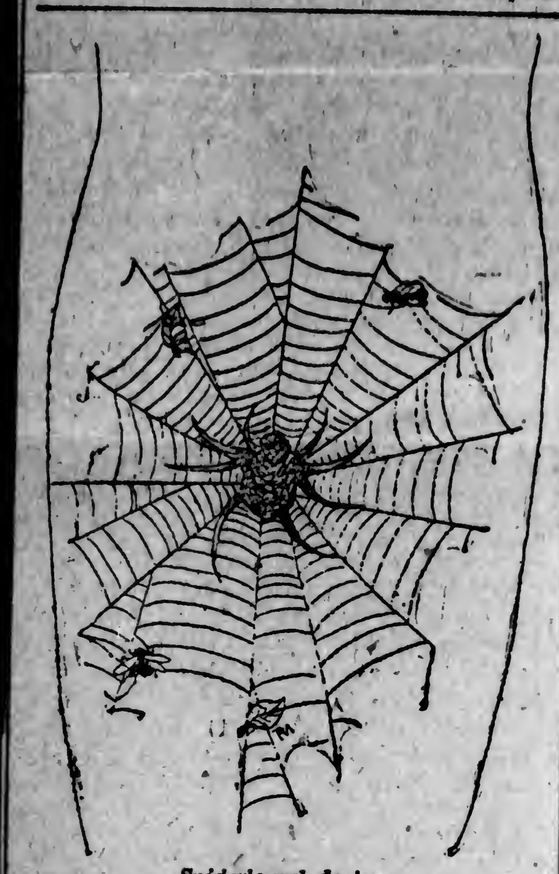
Hori Chio, the Japanese artist tattooer, is a singularly gifted man, and is not 30 years old at the present time. He was formerly a jinricksha coolie—one of the miserable slaves who trundle people about in a small two-wheeled vehicle—and, as is the custom with that class of people, he had a local artist tattoo his body. Becoming interested in the operation, he attempted the use of the needles, and soon discovered his rare artistic ability. For seven years now he has been the leading artist in Japan for people's cuticles, and has made a reputation and a fortune. His renown has so spread of recent years that every prominent traveler who visits Japan adds a goodly portion of his money to Chio's bank account, and bears proudly away the indelible traces of the Jap's wonderful craft. It has become necessary to make appointments a long time ahead, and visitors frequently send their names to Authur & Bond's curio establishment, where Hori is, two or three weeks in advance of their coming.

The pieces of work which Mr. Geffeney carries, and which are herewith illustrated, are all upon his arms. They are remarkable for their lines and shading. The straight lines are as fine as those drawn with the sharpest pen and as true as if laid out with a ruler. Strangely enough, the Jap never makes a single mark to guide his eye, nor does he use any artificial means to draw the lines or figures before commencing. He simply goes calmly to work on his victim with the needles, and never even washes the member until he has done with it. His method of procedure is to prepare a number of flat pieces of wood by firmly binding on from three to twenty fine-pointed needles, laying them down on the end of the stick side by side with their points all even on the end and just separated from each other. When he starts to work the limb is bared, he grasps a brush containing the ink in the joint of his thumb, and then gripping the member in the same left hand, uses the extended thumb as a fulcrum for a leverage—jabbing the inked needles into the skin over the thumb with the right hand and then prying on the stick until the skin breaks with an audible snap. The row of needles is not used the flat way, but edgewise, so to speak, so that a long scratch is formed every time he jabs and pries. As the work proceeds he moves the left hand toward himself and keeps jabbing and refilling the needles from the brush very rapidly. These needles are never used on more than one person and are then destroyed.

The designs executed upon Mr. Geffeney required two whole days, in which considerable port wine was imbibed and much tobacco was smoked to brace up his nerves. The healing required a month, and he wore silk sleeves all the time. During that period three upper cuticles peeled off from the wounds, each carrying a great deal of color, and then the work showed in a bright, clear and remarkably distinct greenish-blue ink with some patches of red. On the right forearm the most noticeable feature is a snake which winds its tortuous coils about from the wrist to the elbow, and there its quick, forked tongue darts out to catch a fly. The curves are perfect, the head flat and natural, and every scale in its entire length is finished in infinite detail. On the under side of the arm is a skull and cross-bones and also a knife thrust through the flesh and again protruding. Its handle is carved and is characteristic of Japanese workmanship. Above the elbow upon the biceps muscle an eagle with outstretched wing is worked out with extreme care. Every feather appers and so natural that it seems as if the breath would ruffle the plumage. A splendid steel engraving could not be clearer. A small floral piece completes the decorations on that arm. On the left forearm a tobacco leaf, worm eaten and with a Japanese landscape upon it is shaded with such a subtle art that no trace of the instrument is visible. The coloring blends from a deep shadow to the whiteness of the skin as softly as the vignette of a photograph. On the upper side above the leaf is a great spider's web with the wily insect in the middle and several flies entangled in the net's meshes. It is here that the accuracy of the drawing is so striking. The lines are as fine as a hair and as straight as a plumb line. The piece is a very attractive one. Above these on the biceps is the crowning triumph of all. It is an argus pheasant,

Gaffeney's right arm.

with all of its magnificent plumage and graceful long tail streamers completed with a softness and delicacy which are simply amazing and which command the beholder's admiration instantly. There, as in the eagle, the details are executed with an indescribable patience and the



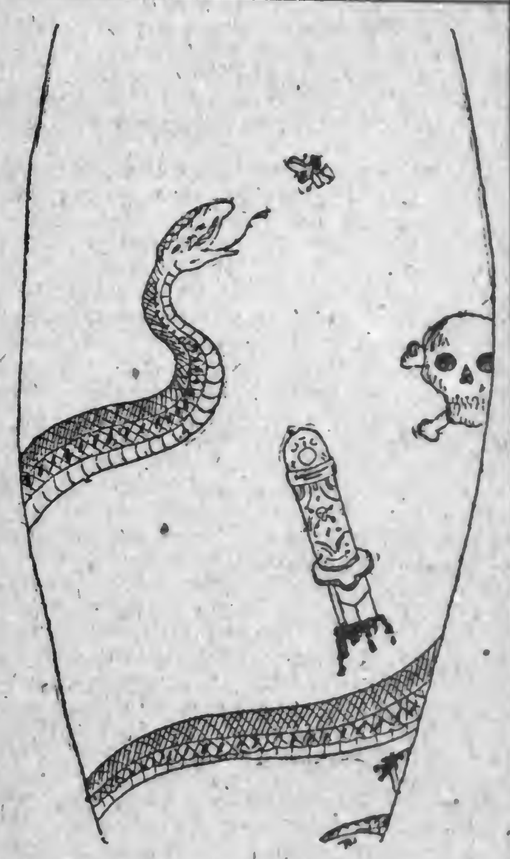
Spider's web design.

An intricate pattern.

drawing is faultless. Not a distortion mars the effect of a single piece, and the wonder only increases with a careful inspection. To be sure the peculiar and inimitable style of all oriental art is preserved, and some of the figures show the novel and charming poses in which only these people would ever place a bird or animal. The price that Hori Chio charged Mr. Geffeney was exceedingly moderate and was a special favor to him because he was so well known in Japan and so much esteemed by the artist. He charged $57 for the whole job. His usual schedule of prices would have amounted to $267. The eagle and the pheasant would have been $65 apiece.

Hori Chio has had some royal patrons and many distinguished travelers bear his pictures upon their persons. An English nobleman who once visited Japan became enamored of a splendid looking Japanese woman who resided there. His infatuation exceeded the usual bounds of love and he sought out the artist tattooer and had the lady's portrait carefully pricked into his white skin. Hori Chio made a beautiful likeness, and the smiles which his sharp needles left will never fade or dim when age has made its wrinkles in the fair girl's face and time has harrowed out all of the old love-lit glances. The Englishman willingly paid $150 for the everlasting portrait and gra[cious]ously submitted to the pain that his i[n]ordinate affection cost him.

Robinson, who was recently killed [in] the orient by Hetherington, was orn[a]mented by Hori, and bore upon his bre[ast] a proud English vessel as she rode in t[he]



Snake and sword pattern.

stream. On his arms, too, were birds and the snake which usually fascinates the would-be decorated. A young American woman conceived a strange idea and had a monster crab etched upon her shapely calf. The secret got out a bathing resort.

One of his most beautiful designs is borne by an English society lady of high degree. It represents a flight of swallows and extends from her rounded shoulder down her tapering arm and nearly to her wrist. It is singularly graceful and of rare beauty. The son of Henry W. Longfellow, who has traveled extensively, is exquisitely tattooed from head to foot. The work is that of Hori Chio and it cost over $1000. He has a large serpent wound about his leg, which is startling in its realistic coils. On his back is a decided departure from the usual designs. It is a gigantic dragon, with all the horrors to which vivid Japanese imaginations have bent their ingenuity, and in its wide-open mouth is a figure of Budda, the god idol which the people worship. The work on young Longfellow consumed several weeks. A companion who traveled with the poet's son had a most elaborate fox chase placed upon his right leg. It was a very expensive piece, and contains dogs, horses, trees, brushes and the cunning animal of the hunt.

Hori's most important commission was in tattooing the royal sons of the Prince of Wales, Prince George, now dead, and Prince Albert Victor. These young men were stamped with the royal insignia of their regal family, the royal coat of arms of their country, the feathers of the Prince their father, and a number of animals and birds.

A prize was once offered in Japan for the most original, ingenious and well-executed piece of tattooing on any man by any person. Hori won the laurels. A countryman bears the prize work. It is a great spider's web which occupies his whole back. From a thread which disappears in his hair at the back of the neck and emerges on his forehead, proceeding down his nose to the chin, the great spider is suspended.

Hori once offered to place a fac simile of a photograph of a tomb, with sixty-two letters on the stone, together with flowers and the iron fence which surrounded all, reduced to the size of a postage stamp and with every letter legible, upon a man's arm for nothing except as an advertisement for himself. The offer was refused for good reasons, so that the finest thing he ever contemplated was not carried out.

Arnotta Bixa Orellana

Color Indian Paint

Is a small tree grows about 20 or 30 feet high The seeds have a thin coating of red waxy pulp which from the ancient called Arnotta it is seperated by throwing into a tub of water and stirring them until the real matter is detached when it is strained off and evaporated to the consistency of putty. In this state it is made into balls and wrapped in leaves and is then known as flag or roll arnotta But when more dried it is made into cakes and called cake arnotta. Treat Bt

Vol 1
P 146

UNITED STATES DEPARTMENT OF AGRICULTURE,
BOTANICAL INVESTIGATIONS AND EXPERIMENTS,
TROPICAL AGRICULTURE,
WASHINGTON, D. C.

Dr. Saffron for
the Kechuas of Ancient
Peru Purchased by the
N. Y. Nat. Hist. Soc.

S.7834.

[illegible]

Dr. Saffron on
the Kechua of Ancient
Peru Purchased by the
Nat. Hist. Mus.

S.8834.

Over

Tattooing By The Ancient Kechuas Of Peru

That tattoing was sometimes practiced among the Kechuas is evident from the marks still remaining on the arms of mummies.

Times May 26 - 1901

Colored Inks in Tattooing.

From Pearson's Magazine.

Until comparatively recently only two colors, indigo blue (or Indian ink black) and red were used in tattooing, but a Japanese increased the number by discovering a permanent brown, and Sutherland Macdonald has now added four more to the list, so that he works with no fewer than seven colors altogether. The difficulty has been to get a color that will hold; any color

Star Jan 23 1903

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can be pricked into the human skin, but those made from minerals will all set up, sooner or later, a state of inflammation of the skin and the color will be forced out again, leaving only an ugly scar to mark the spot. But by careful experiments on his own body, experiments which have been going on for years now, he has been able to produce a very beautiful green, a permanent ultramarine blue, a lavender and, most difficult of all, a rich yellow, all not only perfectly harmless to the most delicate skin, but colors that will hold, and by blending some of these together he is able to produce brilliant effects, which to the uninitiated would appear to be altogether impossible. Tattooing in so many colors, with all their gradations of shading, is a lengthy process—Mr. Macdonald will spend a matter of sixty or seventy hours in completing a design to cover a man's chest—not at a stretch, of course, but working two or three hours a day for twenty or thirty days.

Calling on The President Of Hayti

Calling on the President.

They have a "Champs de Mars." It is simply a big open raw dirt space. It has the general aspect of a couple of squares of vacant lots in a city. The only thing necessary to complete the resemblance is a few dozen empty tin cans scattered here and there. Facing the "Champs de Mars" is the president's palace. This is a large comfortable looking building, surrounded by grounds and gardens. As we drove by, the President and his cabinet were standing on the balcony of the palace. We bowed. The president, or at any rate the man who was pointed out to me as the president, bowed and waved his handkerchief. This was as near as any of our boat's party got to the president, and from all accounts is about as near as anybody gets, natives or visitors. The president evidently believes that the human race is much more admirable at a distance than at close quarters. The president of Hayti is M. Sam. He is from Cape Haytien, and is about sixty years old. He is a dark skinned negro, with a gray mustache. The president's legal term is seven years, and M. Sam has two years longer to serve. It is whispered here that M. Sam will not be re-elected, but I suspect that the people will not have much to say about the matter. The army and the gatling gun will likely do most of the voting, especially the gatling gun.

There is always an opposition party in Hayti, but it is a very quiet party, and only meets on dark nights, in secluded places. No man ever openly confesses that he is in opposition. It is not healthy to do so. If the president does not recognize your merits, or you have a particular friend who thinks he would make a much better president than the one on deck, just keep still about it is the Haytien plan. Some day, by patient waiting, the opportunity may come to you to stick a knife into the then president, and you can say "Sic semper tyrannis," and become a member of the cabinet of his successor, your very particular friend.

It takes time to adjust yourself to the high-toned, exclusive kind of presidents. We had been used to the ordinary kind, like Cleveland and McKinley, whom anybody could see, and later in the day we determined to storm the palace gates, and see if we could not get in to see M. Sam. We first asked Minister Powell if he could not get us an audience.

It was no use, however. He told us the president never saw anybody. Then M— and myself went boldly to the palace gates and asked admission. There was a devoted segment of the Haytien army on guard at the gate, consisting of a dozen soldiers and a couple of officers. They talked a mongrel French, and M— talked back with a pure Washington accent. I threw in a word or two of Choctaw now and then. The soldiers and officers all talked at the same time. It was delightful. I could only understand scraps, but there were a lot of words exploded.

I am a splendid French scholar myself. I studied the language at college, under a German professor. Sometimes I find, however, that I cannot understand or make myself understood in the language. I remember that this happened when I went to Paris, and here the same thing was taking place in Hayti. It is curious how little pure French is spoken in the world. The true language will probably die with my German professor and myself.

We stood at the gate and demanded to see the president. Every soldier replied. The replies were at length, but the gist was that our demand was filed away for future reference. Then M— pulled an official-looking document from his pocket. It was a letter for the president from the State Department at Washington, he said, and must be delivered at once. It was really a general letter from the department, issued by the hundreds to tourists, but it looked formidable. The guard passed it from hand to hand. They looked at it upside down and crossways, and each expressed an opinion at length at the same time.

In the meantime people began to arrive on the scene from all directions, and the crowd grew larger and larger. Every new arrival had an opinion to express, and immediately expressed it with an admirable flow of language. M— thundered along in his demands. "Would they," he said, "insult the great United States? Did they see the seal of the great State Department at Washington on that document?"

They not only saw the seal, but smelt it.

"Did they wish to see warships in their harbor, battering their town to atoms?"

"My braves," he finished, in a burst, "you are soldiers, and know your duty; we are diplomats, and know ours. Take you, then, that letter, with our cards, to the president or his secretary, and say we desire to speak with him once briefly."

It looked as if we had won. An eager, ingratiating look swept over the ebony face of the chief officer. He waved his hand for silence. The soldiers and the populace became quiet. Then the leader spoke in French that even I could understand. He said: "My dear friends, I tell you what, I'll trade neckties, even, with either of you."

We refused the trade, and came away, every soldier telling us volubly that nothing could ever be sent to the president or his secretary. As we went we heard one of the officers say to the other. "It was well; doubtless they wished to poison him."

That remark was probably the explanation of the exclusiveness of M. Sam. There is always a revolutionary intrigue going on in Hayti, and the first step is usually to assassinate the president. Of the eleven presidents of the country only two finished their terms. Nine were assassinated or deported. M Sam probably has that record pasted in his hat, and every time he looks at it he puts a new burglar alarm on his doors and windows.

T. L. Noyes
Star Feb 1 - 1902

Expert Opinion on "Tattling."

From the New York Evening Post.

Do school children of the present day hold in less aversion the "telltale" or "tattletale" than did those who, a quarter of a century ago, braved the master's rod rather than tell? The question is suggested by the report of a test made in the schools of Utica by Superintendent George Griffith. At his prompting 3,000 children were asked to give their written opinion, anonymously, it is supposed, as to whether one pupil should testify against another. Voluntary telling or "tattling" was not meant in the test, but only 15 per cent of the children noted the distinction, so that the result may be accepted as the children's opinion of the "tattler." The question asked was whether it was right or wrong, and it appears that the boys hold more robust views (judged in the remembrance of old school days) on the matter than do the girls. Of the 2,834 who answered the question, 494 boys, or 38 per cent, and 375 girls, or 25 per cent, considered it right not to tell, the larger percentage of both regarding it as wrong.

New York Apr 1895

Aleurites triloba

Dyes Pitcairn Islands

The red dye from the inner bark of the doo doe tree may have its intensity varied by more or less exposure to the rays of the sun while drying.

(Capt. Beachey)

Analine Dyes In China

The Germans have built up a big business in analine dyes. They have the monopoly of such sales all over China. Five great factories in Germany are kept busy supplying the trade, according to the orders sent in from here by the Germans. They have studied the colors which are most used in each locality, and they give the people just what they want.

S Can Feb 2, 1901

This lady's face (Figure 3) is from a portrait of a reigning beauty of those times, and may be considered a fair sample of the fashion. She has a star and half-moon upon the cheek, a circular mark upon her chin, and—marvel of mar-

FIGURE 3.

vels—a coach, coachman, and two horses with postillions upon her forehead! The last ornament seems to have been a favorite, for the author of "'God's Voice against Pride in Apparel'" (1683) says: "'Methinks the mourning

coach and horses, all in black, and plying in their foreheads, stands ready to whirl them to Acheron.'"

Follies of Fashion
Harp mon May Feb-1869

Bixa Orellana Annotto

Fig. 161. Flower and fruit of *Bixa Orellana*, considerably reduced. Original.

It is a small tree with broad cordate leaves somewhat suggesting those of the poplar and clusters of pink flowers

The fruit is a very spiney pod which splits into several valves when ripe the seeds have a red waxy coating Constituting the substance known as Annotto. This is an orange coloring matter used as a dye and also to impart color to butter.

Indigo Plants P220-1

1902

ERICAN HERALD, SATURDAY, AUGUST 30

COLOR AND DYES.

Over 3,000,000 Differet Dyestuffs Are Accessible.

The particular coloring matters known as dyes are not only eminently endowed with the power of selective absorption in regard to light—a power which causes them to appear colored—but their particles or atoms possess a strong faculty for wandering into fibers and fabrics and, moreover, of becoming dissolved therein. This wandering power and solubility in solid materials, possessed to such a high degree by dyes, distinguish them sharply from ordinary colored substances. In the former case the particles travel into fiber and are actually soluble in it; in the latter case, although penetration proceeds, the actual solution of the color in the material is not effected. In short, a dyed fabric is nothing more than a solid solution of the dyestuff in the substance of a fiber.

The number of artificial coloring matters prepared since Perkins' discovery, now nearly 50 years ago, has been enormous. It is estimated that at the present day over 3,000.00 different individual dyestuffs are easily accessible to our industries, while at least 25,000 form the subject of patent specifications. The number of coloring matters furnished by natural agencies is comparatively small, and those that do exist threaten soon to be ignored in favor of coal-tar derivatives. Perkins' great discovery has led to a complete revolution of the color output of the world and has placed at our disposal an infinite series of colors of every variety and shade.

Moreover, it is interesting to remember that the aniline dyes have proved of great service in determining the nature of disease. The germ theeory of disease could not have developed so rapidly and on such definite lines as it has done had not aniline stains been discovered which were soon found to possess the power of marking and individualizing the specific organism by dissolving in it and thus enabling in several instances an exact bacteriological diagnosis to be made.—London Lancet.

General account of Dyes from various plants P.P. 375 to 377
Dictionary Economic products
of India Watt vol 6 Part 3
1893

Retake of Preceding Frame

1902

MEXICAN HERALD, SATURDAY, AUGUST 30

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General account of Dyes from various plants P.P. 375 to 377
Dictionary Economic Products
of India Vol 6 Part 3
1893

Why should a plaster used for cuts and bruises be called court-plaster? B.

The name comes from the use of such plasters by women of royal courts. In the days of King Charles I fashionable women put on their cheeks plaster crescents, stars, circles or crosses, even such designs as a ship in full sail or a coach and four. Under Queen Anne these devices became badges of political partisanship.

Times May 14 - 1899

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Toronto May 14 - 1849

Removal of Tattoo Marks.

Various methods suggested for removing tattoo marks have appeared from time to time in these columns. The following, mentioned by the Paris correspondent of the Lancet-Clinic, seems new: The principle of the method is to form a dermic destruction of the tattooed part. Here is how it is done: It is first necessary to paint over the tattooed marks with a concentrated solution of tannin; afterward, by means of fine needles, we make a series of pickings over the tattooed design. Over the surface thus picked we pass a stick of nitrate of silver. At the end of a few minutes we see detached the black pickings previously made, and know that the superficial layers of derma contain a tannate of silver. In order to assure success this surface must be powdered with tannin two or three days. The end is very simple. After an inflammatory action, lasting two or three days, the picked parts turn black, forming a thin crust, very adherent to the deeper skin, but painless. At the end of from fourteen to eighteen days the scab falls off, and in its place a superficial red mark is seen, which gradually fades away until, at the end of a few months, all signs of coloration disappear. Dr. Baillot also suggests the use of binoxalate of potassium in place of nitrate of silver. Of course, antiseptic precautions are all taken in performing this operation, and the old tattoo needle is used to remove all tattoo marks.

Scientific American
January 25-1896

Jalisco

Jocuistle Bromelia fimfuin

Iguamara " Karatas.

Timbiriche Jocuistle, Piñuela

O'afnava Bromelia pinguin L

Timbiriche O'Carolo Bromelia

Karatas L. in

La naturaleza vol 6 P 1184 347

Mescocott O' manguel

in Bromelia Karatas adans

La naturaleza v 5 P 293

Tattooing Among The Females of The Kinager Negroes Africa Major Powell Bolton

The favorite decoration among the women is a raised pattern wrought on the body when they are young. Small incisions, geometrically arranged, are made in the skin, and into these ashes are inserted. The wounds heal in permanent raised lumps. The natives of the Nandi Escarpment had curious habits. Some of them coated themselves with white paint to keep off the flies.

New York Tribune
March 15-1904

33

Tattooing of men of
The Dodinga Tribe of Africa
Major Powell Wotton

Nearly all the men had two cuts on each cheek and on the forehead, like the Soudanese.

New York Tribune
May 15 - 1904

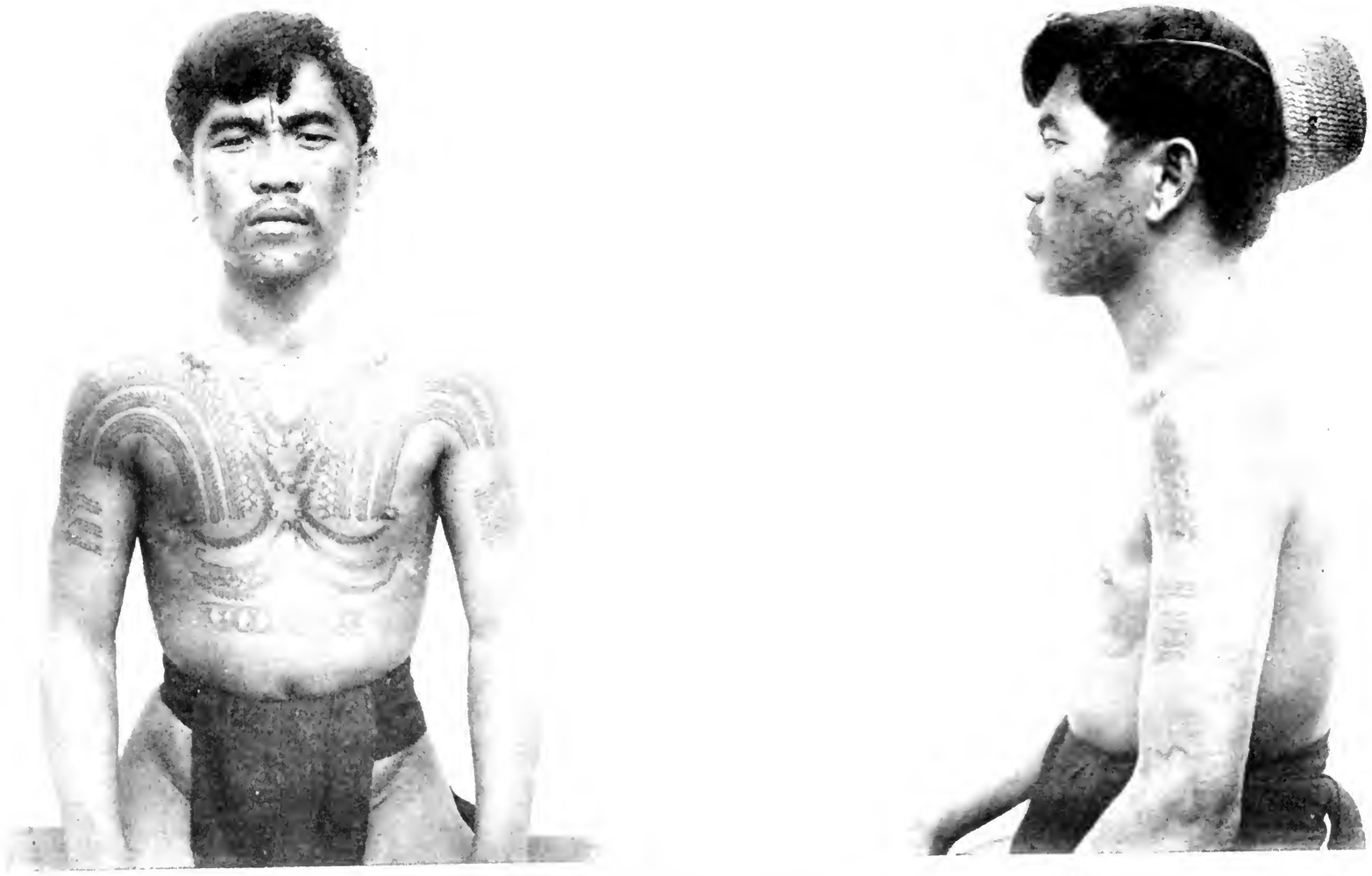
Tatoing of Females
of The Dodinga Tribe Africa
major Powell Boton

Their women had a regular pattern scored on the body,

new York Tribune
Sunday 15—1904

Bontok Igorrote With Elaborate Tatooing Philippines

BONTOK IGORROTE WITH ELABORATE TATOOING OF THE HEAD HUNTER.



BONTOK IGORROTE WITH ELABORATE TATTOOING OF THE HEAD HUNTER.

A REVIVAL OF TATTOOING

WITH the ordinary tattooing as seen on the arms and chests of sailors we are all more or less familiar; even the more elaborate designs on the "tattooed man" at the museums excite but a passing interest; and indeed, except in rare cases, the designing is fantastic and the workmanship is crude.

There are, however, some very good examples of the art among Uncle Sam's sailors, of which Seaman Peterson, of the Chicago, is an excellent example. His entire back is covered with an exact representation of the crucifixion.

From a photograph provided by the American Museum of Natural History.

It cannot be expected, however, that a fad adopted from the Daks of Borneo, the natives of New Zealand and other uncivilized nations would be very rich in ~~elaborate design~~ or refined color schemes, but nevertheless the Japanese, that "people of infinite patience," have elevated tattooing to the level of a fine art.

Not long ago it became quite the thing for young men of fashion—and young woman, too—to have a small design tattooed upon them by one of these Japanese tattooers, and many of these were very beautiful in design and perfect in execution. It was surely a very original way of showing the depths of one's affection to have the initials of one's affianced with a heart, or true lover's knot, or even her portrait, in a perfect and beautiful miniature, tattooed on one's arm or over one's heart, but a rather dangerous one, too, considering the instability of things in general and of the "little god" in particular.

The picture given here is perhaps one of the most remarkable examples of Japanese tattooing. According to the popular superstition of the lower classes in Japan, the numerous earthquakes are caused by a gigantic catfish, whose head is under Oshin and his tail under Kioto. His anger and struggles are supposed to cause the seismic throes. It is this catfish that is represented in the example here presented, and the work is so fine, the perspective so perfect, that from a short distance the fish seems to be actually upon the back of the man.

Times Apr 24 1904

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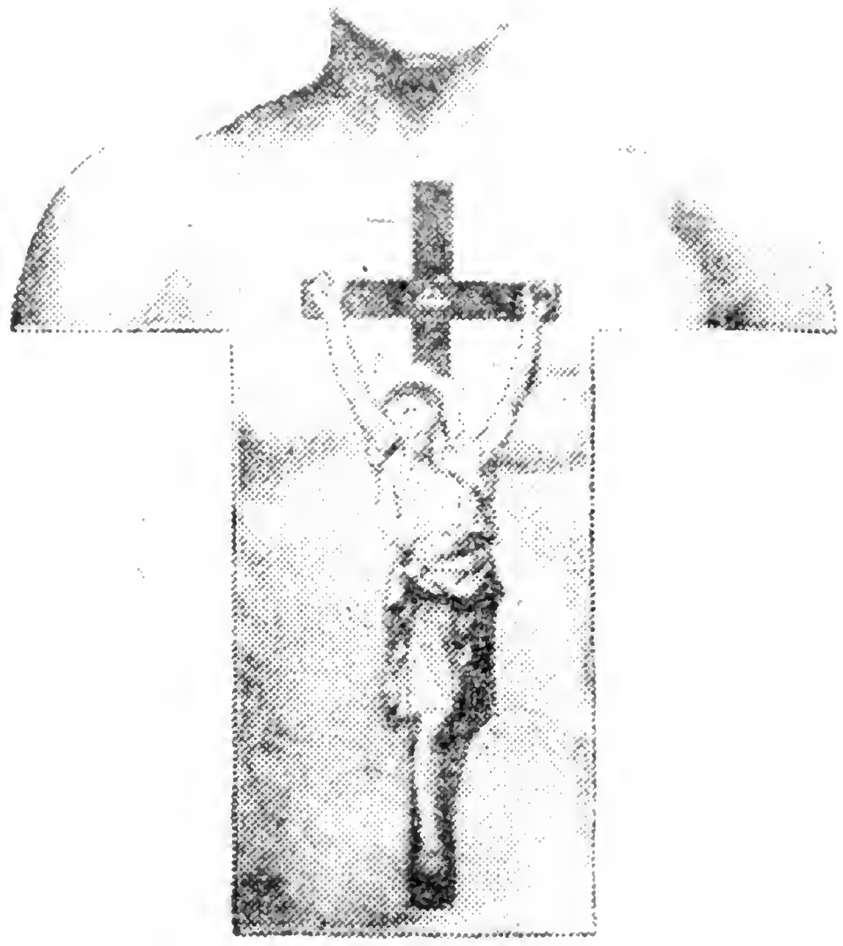
Kind of Court Plaster, Used By Ladies, During The Time of Charles II - England

PATCHES, IN THE TIME OF CHARLES II.

The ladies of Charles's court adopted the fashion of covering their faces with patches. It is said that one lady used court-plaster to cover up a pimple, that it at the same time added to her beauty; that from such a beginning the fashion went on, till the cheeks and forehead were covered with sun, moon, stars, and fanciful designs.

TATTOOED MISSIONARY.

A Jesuit missionary to China has a picture of the crucifixion tattooed on his chest.



A Jesuit missionary to China has a picture of the crucifixion tattooed on his chest.

Chicago Tribune Dec 28. 1906

Tattoe Ornamentation
The Caribbee Indians
Engrave on their heads &
numerable Cross Like Marks
and different devices each
according to his fancy, and
they make these lasting Marks
with sharpened bamboo
sticks. Dr Diego Alvarez
Chanca a Surgeon to
Second Fleet of Columbus
Jan 1494

Tattooing

TATTOOING, or the custom of permanently marking the skin with colored designs, is of ancient origin. This practice is forbidden in the Scriptures; so it may be inferred that it was customary among other tribes than the Israelites. The custom of tattooing among civilized nations is fast dying out, though there are a few establishments to be found where it is still done. Among these s one on the Bowery in New York, where the operator advertises performing the operation in thirteen different colors.

Tattooed marks have played an important part in the conviction and acquittal of criminals. The absence on the claimant of these marks known to have been on the body of Roger Tichborne was an important point in the famous Tichborne trial, and there are many incidents on record where tattooed marks have sent men to the gallows or stayed the hand of the executioner.

In some countries tattooing had a religious significance; but in olden times it was practised merely as a method of adornment. The Japanese and New Zealanders are famed as expert tattooers, and a good workman can cover a man's back with all manner of elaborate designs in a single day. Some authorities assert that tattooing was put on the body in ancient times as a substitute for clothes.

1905

Eyebrows Stained

The Caribbees whom we have taken prisoners have their eyes and eyebrows stained circularly around which I think they do for ostentation and also because it gives them a ferocious appearance

Dr Diego Alvarez Chanca Surgeon To Second Fleet of Columbus Jan 1494

Tribal markings Africa

Most of the African women scar their bodies to beautify them. I have seen girls with Persian shawl patterns on their breasts and abdomens, and others with great welts on their foreheads and cheeks, marking the tribe to which they belong. In the Sudan there are scores of such tribal marks and each tribe has its own way of scarring.

Tribal Markings Okehi

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Missing Proceeding Frame

Henna Toilet &c

1888

The Use of Henna.

The h[illegible] is an important article of an eastern lady's toilet, particularly on festive occasions; it is prepared from the leaves of a medium sized tree and serves to dye the feet of the women and children red. This henna, so indispensable to eastern ladies, is used for two purposes—as a remedy for boils, prickly heat, itching and the like, and as an ointment for the hands and feet. The leaves, resembling those of the myrtle, are not efficacious if used alone; they are dried, pulverized and mixed with some lemon juice and water. A stiff paste is made of this, which must be exposed to the sun for several hours; when used it is again softened with lemon juice.

The lady who is about to undergo the dyeing process is stretched out full length on her back and is not allowed to stir. The paste is put on the sole of the feet, the toes included, about an inch thick—the upper part of the feet is never dyed; soft leaves are then applied as a covering and the whole is tightly wrapped in linen. The same process is gone through with the palm of the hand and the fingers. To keep the application in its place she must remain all night perfectly still without moving; for no other parts but those named must have the dye, and a smudge on the back of the hand or on the finger joints is considered a great disfigurement.

All this time she is dreadfully teased by the swarms of musquitoes and flies, but she dare not move to drive them away. In the upper classes women slaves have to watch all night by their mistress, to keep these plagues off with fans until the paste can be removed in the morning. The same process must be gone through three nights running, to obtain the desired dark red tint; then it sticks for about four weeks and resists all washing, —Memoirs of an Arabian Princess.

Decorated Chief of the Gold Coast—

— "Speaking of extravagance in dress," writes Captain Crosstree, "the most expensively dressed man I ever saw was an African chief on the gold coast. His wives had annointed him thoroughly with palm oil, and then powdered him from head to foot with gold dust. You never saw in your life a man got up so "utterly regardless of expense."

Dye . Yellow . Zuni

Safflower is used to dye
Yellow by the Zuni Indians
of New Mexico

Stephans

The old Brisbane
tribe known to have
numbered not many
years ago some
12 TT in new south
Wales extinct. not a
word of its language
even being spoken
by any human being

62838	Shell Hair Pin.	Mc. Mahon Mound Tenn.		
62839	"	"	"	
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62845	"	"	"	
62846	"	"	"	

Northern Thibet
Blackfaced Females

The people of eastern Tibet do not differ materially in appearance or stature from those near the Koko-nor, though their features are perhaps more clear-cut, the nose thinner and more prominent, and the eyes larger. I saw among them not a few with hazel eyes and curly or wavy hair. The women are as tall as the men, much more fully developed, and frequently quite good-looking. But the iron rule of fashion forces them to hide their rosy cheeks under a thick coating of *teu-ja*, a black, sticky paste made of catechu. This is to preserve their complexion from the cutting wind —so say those who are matter-of-fact, but others tell a different tale. More than a hundred years ago there lived at Lh'asa a great saint named Démo Rinpoch'é, who did much to restore the purity of monastic life, which had greatly suffered under the licentious rule of the sixth pontiff of Lh'asa, Ts'ang-yang jya-ts'o. Canon law says that when a monk goes abroad he must keep his eyes fixed on the ground some little distance ahead of him, looking neither to the right nor to the left; but the rosy cheeks and bright eyes of the women caused the lamas to forget this law, and great disorders ensued. Démo Rinpoch'é then commanded that no woman should go abroad unless her face was well besmeared with black, and soon this became a fashion throughout the whole country.

Century Feb 1891

The painting of the face is one of the most curious relics of barbarism on record, dating back to the very infancy of the race. The first men painted their faces in time of war to make their aspect more terrible, and in time of peace to render themselves more attractive to the fair sex. The sense of color in those primitive epochs was far from being as delicate as that of the modern æsthetic. If the pale shades invented by the dyer of these days had then been known, they would have been dispised as offering nothing tangible to the vision. The first colors were red, yellow, blue and black, found in a state of nature or prepared by simple methods, and the only rule of art for their use was that they should be liberally applied. The American Indians, when they crossed Behring strait from Asia or were blown across the Pacific at some date so distant that it can only be guessed at, brought the custom with them, and those which civilization has spared preserved it to the present day in its prestine purity.

All the ancient tribes of the north of Europe practiced a similar mode of decoration when discovered by the Romans—those of Germany (mentioned by Tacitus), the Britons and the rest almost without exception. The Picts, who were a Scottish tribe, must have used an abnormal quantity, as their name implies, to have justified the special appellation. The custom was from the first so general, so typic savagery that it resembles an instinct—that is, it is one of those blind impulses of unenlightened humanity which only a high state of civilization could correct in the case of men, and in the case of women an object more feminine.

Archaeological nov 1893

NATURE'S ALGERIAN INK BOTTLE.

By the Union of Two Rivulets Splendid Writing Fluid Is Formed.

From the Pittsburg Dispatch.

It is a recognized fact in science that very few great rivers have been thoroughly explored by going up stream. For nearly 2,000 years travelers and explorers endeavored to discover the sources of the Nile by ascending that wonderful river. But by the time they had reached the difficult part of the stream their supplies and energy were exhausted, and they could go no further. It is only by seeking the sources of rivers by overland routes that explorers meet with success. It was in this manner that Henry M. Stanley traced the route of the Congo in Africa. In this way of procedure Frederick Schwatka was enabled to float down to Yukon, and Speke found the secret of the River Nile.

One of the most curious rivers that has come to the knowledge of men is the Webbe Shebeyli, of Eastern Africa, a deep and rapid stream, abounding in strange fish and ferocious crocodiles. Although it flows for hundreds of miles through fertile lands, the immense volume of water never reaches the sea. A short distance north of the equator the river is lost in a desert region a few miles from the Indian Ocean.

Some of the more recent explorers of Alaska and British America claim that the Mississippi can no longer be regarded as the largest river on the North American continent. This distinction is claimed for the great Yukon River. According to Ivan Petroff, who spent over two years in Alaska, collecting materials for the last census, the Yukon empties into Norton Sound about one-third more water than the Mississippi pours into the Gulf of Mexico.

The Yukon basin comprises the larger part of Northern Alaska, and 600 miles from its mouth the river is a mile in width. Many centuries before it was discovered by white men it very likely served as the water highway into the interior, for tribes whom we believe to have crossed from Asia to the American continent. The Yukon River is over 2,000 miles in length.

Travelers report that in Algeria there exists a small stream which the chemistry of nature has turned into ink. It is formed by the union of two rivulets, one of which is very strongly impregnated with iron, while the other, meandering through a peat marsh, imbibes large quantities of gallic acid. Letters have been written with the natural compound of iron and gallic acid, which forms this small yet wonderful stream.

The Rio de Vinagre, in Columbia, is a stream the waters of which, by admixture with sulphuric acid, become so sour that the river has been appropriately named the Rio de Vinagre, or Vinagar River.

The Orange, or Garieh River, in Southern Africa, rises in the mountains, which separates Natal from the Orange River Free State. The length of this stream is 1,000 miles. Its banks abound in various valuable woods, and around it are found rich copper ores. In this stream are many varieties of fish, which are found until the river passed through a rocky region containing copper, below which the water is said to be poisonous, almost instantly killing the fish that venture near it.

Harvey seems to be ambitious to take the lead in preparing all good things in gastronomy. He has designed a revolving board to cook the celebrated Planked Shad, which causes it to retain all the flavor and sweetness while cooking. This will give him the facilities to serve this favorite dish of Planked Shad at all hours, and in a manner to please the most fastidious. Planked Shad cooked in this manner is superior to any cooked at the seashore or in the open air.

Pimples, blotches, blackheads, red, rough, and oily skin, prevented by **Cuticura Soap**, the most effective skin purifying and beautifying soap in the world, as well as purest and sweetest for toilet and nursery. The only preventive of pimples, because the only preventive of inflammation of the pores.

Sold throughout the world. British depot: F. NEWBERY & SONS, 1, King-Edward-st., London. POTTER [illegible] CHEMICAL CORP., Sole Props., Boston, U. S. A.

ment Tattoo Dressing
Samoa

The men tattoo themselves after a fashion which gives them the appearance of being clothed, but neither they nor the women have any covering except a small skirt fastened around the loins. Their houses are very pretty, with large, dome-shaped roofs.

men. The Indian serfs were compelled to labor without pay; they were restricted to certain limits; they could make no legal contract; some of them were locked up at night; adults and women, as well as children and males, were subject to the lash at the order of the friars: and goads and whips were used by monitors in church to correct the irreverent and inattentive.

In church records and in common conversation, the friars designated the Indians as *gente sin razon*, people without reason, as distinct from the whites or reasoning people, *gente de razon*. No Franciscan or Dominican friar, no Jesuit objected to the use of this contemptuous designation in California or Lower California; none recommended an aborigine of California or Lower California as suitable for any responsible civil, military, or ecclesiastical office. After the Indians of the peninsula had been under the instruction of the Jesuits for more than two generations, they still, in the opinion of Venegas, lacked "rationality, manners, utility to themselves and to society, and every quality that gives dignity to humanity." He might have been more complimentary but scarcely more explicit. Baegert, a brother Jesuit, expressed himself in similar spirit. He said "they have neither reason nor regard for the future; they follow their impulses like cattle." La Pérouse, the distinguished French navigator, who visited Monterey about a hundred years ago, wrote that the friars had come to the conclusion that the reason of the Indians could not be developed; long instruction did not enable them generally to comprehend that four and four make eight. In 1792, the equally distinguished English navigator, Vancouver, could not discover that the Indians at San Francisco had derived any benefit from their conversion; they were still "in the most abject state of uncivilization." Kotzebue, the Russian navigator, obtained a similar impression from his inspection of the Indians at San Francisco in 1815. Eleven years later, Captain Beechey, at the head of a British exploring expedition, entered our bay, and in his presence the friars spoke of their red converts as *bestias*, beasts. He said of them that they possessed "neither the will, the steadiness, nor the patience to provide for themselves." In 1839 Forbes wrote of them as "superstitious and pusillanimous slaves." He says "the act of making the cross, kneeling at proper times, and other such like mechanical rites, constitute no small part of the religion of these poor people." Something of the estimate in which the aborigines were held may be inferred from a story told by Beechey. While visiting the mission of San José, he took dinner there, and after the meal the friar in charge amused himself and his guest by wrapping pancakes or tortillas into balls, which he threw at the heads of his attendant Indian servant boys, whose duty it was to catch these missiles, on the wing, with their teeth and devour them.

The aborigines never showed any zealous faith in Christianity. Unlike the negroes in the southern States, they took no delight in singing hymns among themselves; unlike the Polynesian Christians, they never went out to convert the neighboring heathen. When they escaped from the missions, as they frequently did, they always left their new religion behind them. In the course of three-quarters of a century thousands of such fugitives fled to the San Joaquin and Sacramento valleys, and to the Sierra Nevada, and mingled with the wild tribes, without leaving the least trace there of permanent Christian influence.

The friars did not teach the aborigines to be great mechanics. Among its Spanish settlers, the territory did not possess one blacksmith, carpenter, wheelwright, shipwright, or turner competent to take a respectable position among his fellow-craftsmen at the time in London, Paris, or New York. No good plough, good wagon, good boat, or good rifle was ever made in a mission workshop. The Indians did not have an opportunity to learn thoroughly any mechanical trade, or any of the finer branches of horticulture. There was no skillful nurseryman among them.

The missions under Spain produced nothing save tallow for exportation. They accumulated no wealth save by the natural increase

of their herds. They had seedling grapes, figs, pears, olives, and a few other fruits, but at most of the establishments not more than enough for the use of the white residents. Even grain was so scant in quantity that in ordinary seasons the Indian women were sent out at most of the missions to gather acorns and grass seeds, and the roots of wild plants, to supply the deficiency. The missions never paid their own expenses.

So soon as the aborigines fell under mission control, they began to die out. The number of the neophytes continued to increase for nearly sixty years, but always by additions from without, never by the excess of births over deaths. The proportions of males to females, and of adults to children, were usually very large. In 1828, Soledad had twice as many men as women; San Luis Obispo, San Antonio, and Santa Clara 90 per cent more; San José, Santa Clara, and San Carlos each 25 per cent more. In 1826 there were 5,600 children at all of the missions, or only about one-third as many as there should have been in a growing population. The small number of girls, as compared with boys, at some of the missions, suggests suspicions of infanticide.

The mortality was very large. In 1827 the deaths numbered 1,527, while the baptisms were 961, showing that there were 54 per cent more deaths than births. There was a decrease of 2½ per cent of the entire Indian population at the missions in that one year. With the same number of deaths and no more births, the whole race would die out in 40 years. This great mortality is not attributed to any exceptional epidemic. At San Francisco the annual mortality in 1815 and 1816 was 25 per cent. The general average at the missions from 1769 till 1835 seems to have been about 7 per cent, or three times higher than that among the white inhabitants of California then and now.

There was no well educated physician among the Franciscan friars or their military companies. Various infectious and contagious diseases, introduced by the Spaniards, raged with destructive and almost unchecked fury among the aborigines. We hear nothing of inoculation; nothing of vaccination until after the smallpox had prevailed extensively for thirty years. Under the aboriginal treatment, measles and diseases of little note in civilized communities were generally fatal to the red men.

There is no record to show that any of the friars ever studied the causes of this frightful mortality. It seems to have been regarded as a matter for which there was no remedy. The Indians did not work enough to hurt them. They were driven to toil, but never to excessive exertion. The feeling between them and the friars was generally very kind on both sides.

Under American rule the Indians have died as rapidly as under Spanish and Mexican. About 30 years ago several hundred Indian children were apprenticed as servants in American families, and, though treated with much kindness in many cases, most of them died of scrofula or consumption before reaching the age of 20, and nearly all before 30. After some inquiry I have heard of only one who has survived to be 40 years old.

Notwithstanding the great mortality among the Indians generally, some of the older generation reached a remarkable longevity. There is perhaps no other race in which so large a proportion of persons have reached an age of 110 years or more. The matriarchal age of 130 is reported at San Gabriel and Santa Cruz.

Many of the Indian women at the missions became the wives of Spanish-American soldiers, themselves of mixed blood, and their descendants were a handsome, healthy, prolific race. They had however been bred in ignorance and contempt of agricultural and mechanical toil; and their idleness, fondness for gambling, careless management of their property, and willingness to mortgage their land for money at very high rates of interest, partly perhaps consequences of their Indian blood, have brought most of them to abject poverty, and many to gross demoralization.

After 119 years of association with white men in California, there is not now in our State one first-rate farmer, mechanic or bookkeeper of pure aboriginal blood; not one merchant or owner of a large herd of cattle

Californian May 1871

held some knowledge that might save her a life of misery? Tell me, would you?"

"No," he said, "neither for my own daughter, nor the daughter of any man; such criminality is not easily forgiven."

"Then I must tell you the truth, and how I know it."

And she did tell him. And when she had finished he did not speak, but looked steadily before him with such a gentle, pathetic look in his face, she could hardly bear it. She remembered to have seen that same look, years before, when wife and children were taken from him. It had been habitual in the time of those long past trials. She had rejoiced when all trace of it passed away; and now it had come again. Would it remain, she wondered.

"Have I done wrong in telling you?" she asked.

"No," he said, "but I wish you had told me sooner. You had better go back to Hope, now."

In the morning, when Mrs. Hildreth came again to the library, she found Mr. Brownell still there. He had not been in bed all night.

"Is Hope awake?" he asked.

"Yes."

"Have you told her anything?"

"Not yet."

"Then don't say a word to her now—nor ever. Take what measures you please to let it be known that there will be no wedding here to-day; and tell Hope so, and let her come to me when she chooses."

And this was all the world saw of the strong man's disappointment.

Hope met him at breakfast, wondering. Unconsciously to herself, there was relief in her face, and he saw it. He stifled his pain, and kissed her with a smile.

"What does it mean?" she asked, clinging to him.

"It means that I have changed my mind about getting married at present," he answered, "and possibly forever. I have considered this matter deeply, Hope; you are too young a woman to be my wife. Be my daughter, rather; let us content ourselves with that relation. Whatever slight disappointment there may be on either side will soon wear off, and our true relations will easily adjust themselves."

Hope felt her reprieve in these words; and his acting was so perfect she was completely deceived. "'Whatever *slight* disappointment there may be on *either* side.' Did he indeed care so little, then? Well, thank God, thank God!" The fervor of her whole soul went into these words. And then, being of that complicated and "gyrotwistive" sex whose rapid transits of feeling have puzzled mankind even from the beginning, she came down from her thanksgiving, and went off on a side issue.

"But Mr. Brownell," she cried, "there's the wedding dress, you know."

"Save it," he said, "it will do for a ball dress when you go back to Diamond Spring City. Won't it astonish the natives in your Californian home?"

"In my Californian home," she repeated in wild elation. "Oh, what makes you mention that?"

"Hope," he said, "your roses have been fading for some time. You must go home and recuperate."

And then they sat down to breakfast, and he, at least, went through the motions of eating.

HELEN WILMANS.

[CONTINUED IN NEXT NUMBER.]

CORONATION.

A Poet's fancies rise and throng—
Then works he patiently and long,
And gives the world a goodly Song;

And men applaud and clap their hands,
And send the Song through many lands—
But who the Poet understands?

While nations shout, he sits apart,
Crying, in weariness of heart,
"Alas! the limits of my Art!"

HENRIETTA R. ELIOT.

may 1881

CALIFORNIA UNDER THE FRIARS.

From 1769, when the first white settlement was made at San Diego, until 1835, when the property of the missions was subjected to the control of the civil or secular authorities by the decree of "secularization," California was under the dominion more or less qualified of the friars or brothers of the Order of St. Francis. Until after the American conquest, the Jesuits never had any establishments within the territory now covered by our State; but for nearly a hundred years they had been at work among the savages of the peninsula of Lower California, when in June, 1767, they were surprised by the decree sent secretly to all parts of the Spanish Empire that, without warning or delay, without individual accusation, without a hearing, without a judicial sentence, and without compensation, they should all be arrested and banished. Their expulsion from the viceroyalty of New Spain, as Mexico was then called, was accompanied by an instruction that the Franciscans should take charge of the missions in Lower California.

Soon afterward reports were received that Great Britain (which had recently issued with great triumph from the Seven Years' war, and, besides conquering Hindostan and Canada, had secured her commercial and naval supremacy) was preparing to send an exploring expedition to the Pacific; and, as the English had already planted great colonies on the Atlantic shore of North America, fears were entertained that they might seize part of the Pacific side of the continent. The Spanish Cabinet thought that the cheapest method of averting the danger was to occupy the most desirable country in advance. Before Cook sailed on his first voyage, orders were issued to Junipero Serra, the head of the Franciscans in Lower California, to plant additional missions, as soon as convenient, near the harbors at San Diego and Monterey, and at such other immediate points as he should consider most suitable. Friars, soldiers, ships, and supplies were furnished to enable him to comply, and he gladly undertook the task imposed on him. He started without delay, and encountered no serious obstacle. The country was open, the soil was fertile, the climate was the most genial he had found anywhere, the Indians met the strangers in a friendly manner, and, though stupid, they seemed to be not unfit for conversion.

At the end of the first five years, five missions had been established, and the average distance from each to its nearest neighbor by the traveled trails was about one hundred and twenty miles. As there were only two friars together, and usually thousands of Indians in the vicinity, some of them disposed to steal, and even to murder, ten soldiers were stationed at each mission to serve as guards, messengers, and herdsmen.

These soldiers were under the superior command of a "governor," even if he had no higher rank in the army than that of a captain, but his governorship did not raise him beyond the control of the president of the missions. These were the chief objects of governmental care, the military department being considered as a mere auxiliary and subordinate. Such few controversies as arose between the friars and the governors resulted from the maltreatment of the Indians by the soldiers, and if referred to the Viceroy were always decided in favor of the friars, who, however, were generally moderate in their demands and conciliating in their conduct.

So long as the Spanish dominion was maintained, all the missionaries were natives of Spain or of the Spanish islands in the Mediterranean. Most of them had reached middle life before coming to California, and, so far as we can learn from their writings and the books of others, all were sincerely devout, humble, and ascetic men. Serra himself made a near approach to the ideal of Franciscan perfection, and he found, or at least publicly expressed, no cause of serious complaint against any of his companions. The military officers made no charges against the missionaries except mistakes of policy in governing the Indians; and Vancouver and La Pérouse, who landed on our coast in the latter part of the last century, while criticising the management of the missions, had nothing to say against the character of the missionaries. The first notable scandals about the conduct of ecclesiastics in California arose after the authority of Spain had been overthrown, and natives of Mexico, who had assumed the habit without adopting the ascetic spirit of St. Francis, succeeded their brethren of the Old World, who had left the country or died.

In 1774, orders were issued for the establishment of two towns or *pueblos* in California, and

the results were San José, founded in 1777 by fourteen families, and Los Angeles, founded in 1781 by twelve families, most of the adult male settlers in each case being men who had come to the territory as soldiers, and who were still under obligation to render military service whenever they might be summoned to resume their arms. These towns were separated from each other by a distance of four hundred miles along the traveled road, and each was known in its own region as *el pueblo*, or "the town;" and San José was generally designated by that title by all the Spanish-speaking population north of Gilroy as late as 1852. The law may have recognized the existence of *pueblos* at Yerba Buena or Sonoma, but common speech did not.

The judgment shown in the selection of the sites of the Spanish *pueblos* has been approved by time. San José and Los Angeles are now the largest two cities in California south of San Francisco Bay, and also the largest in the State not situated on the edge of navigable water. Both are remarkably beautiful places—garden cities, centers of horticultural skill and activity.

These were the only towns that Spain founded in California; nor did she make much effort to increase their population. She did not survey the unoccupied lands and throw them open to settlement. She did not invite immigration from foreign countries, nor aid any large number of Mexicans to cross the Colorado Desert from Sonora. She did not adopt any plan of civilian colonization. She offered no prizes in California to the industrious or ambitious. She did nothing to advertise the attractions or make known the resources of the country. One town was built fifty miles from the anchorage of San Francisco, and the other one hundred miles from San Diego. The two magnificent bays of the coast were avoided, thus proving that the sites were not selected for their commercial advantages. The situations had no fitness for military strongholds. It is evident that the main objects of the Spanish Government in establishing these *pueblos* were to obtain a small indigenous population, Spanish in sympathy, and partly Spanish in blood, to produce soldiers for the missions and *presidios* (fortifications) at the sea-ports, and to plant the germs of a future Spanish-American province.

After the recognition of Mexican independence in California, the last and most northern mission was founded at Sonoma, making the twenty-first in number. The entire list, with some abbreviation, may be designated thus, commencing at the south: Diego, Rey, Capistrano, Gabriel, Fernando, Buenaventura, Barbara, Inez, Purissima, Obispo, Miguel, Antonio, Soledad, Carlos, Bautista, Cruz, Clara, José, Francisco, Rafael, and Solano. These missions, about 1830, had 20,000 Indians, 210,000 neat cattle, 150,000 sheep, and 30,000 horses, and in average years harvested about 100,000 bushels of grain, including wheat, maize, barley, beans, and peas.

The missions prospered till 1810 when the Mexican revolution broke out. Then the power of Spain in California was crippled, never to recover. The appropriations were not paid promptly, and the friars, unable to supply their convents with the customary, but simple, food and clothing without an annual contribution from the government treasury, lost their zeal. They disliked the Mexican people, and hated the revolution. Discord arose between the military and ecclesiastical departments; the Indians and soldiers became insubordinate; tillage was neglected; the cattle were slaughtered improvidently, and some of the converts fled to the mountains. Two or three times the subsidies were paid for periods of several years, and the statistics show an increase of the herds and converts at some of the missions, but the discipline never was restored, and the decay that began with the outbreak of the revolution increased till the final dissolution.

The project of secularizing the missions, first proposed in Spain while Joseph Napoleon was on the throne, was agitated by the Mexicans soon after they achieved their independence. They considered it a first step toward a rapid development of California. They imagined that the adoption of a government republican in name would give to their country a growth as rapid and marvelous as that of "The Colossus of the North," as they styled the United States. One of their first legislative acts was a colonization law, but this could not be enforced in California until the land had been taken from the friars, for they owned nearly everything, as guardians of the Indians. The discussion of the secularization scheme, and the certainty that it would be adopted at no very distant time, had a demoralizing influence on the missions, and when the officers of the law arrived with their commissions to take charge of the property, little was found. The native Californians of Spanish descent in the vicinity had helped themselves to the calves and colts which were a large part of the wealth of the ecclesiastical institutions. The distribution of cattle, agricultural implements, and land to the Indian converts was a sham. Little was given, and that little was either of no marketable value, or was soon wasted. In a few years the white men owned everything, and the Indians nothing. The red men, left without restraint

or guidance, generally abandoned the custom of tilling the ground; and many, migrating to the mountains or interior valleys, where they could be far from the whites, relapsed into complete savagism.

The Franciscans were about as successful in educating the Indians as the Jesuits had been previously in the peninsula, and as the Protestants have been in our State under the American dominion. But the civilization of the red men was a mere varnish. There is not one well educated Indian family in California or Lower California; not one village or rural neighborhood where an Indian population lives comfortably in civilized style. Whether the failure of the red men to learn the industrial arts of Europe, and his rapid disappearance when in contact with the Anglo-American, are results of congenital mental deficiency or of defective methods of instruction, is a question that allows plausible argument on either side, and I shall not attempt to discuss, much less decide it, in this paper. We have conclusive evidence that the Indians have been dying out ever since 1769, so that their disappearance since the discovery of gold is only a continuation, under accelerating influences, of changes that were observed, and perhaps commenced, soon after the standard of the Cross was first permanently planted at San Diego.

Such is a brief account of the dominion of the Franciscan friars in California. A few *adobe* buildings, and some trees and musty records, are the chief results preserved to our day of their arduous and self-sacrificing labors. Though many thousand manuscript pages written by the friars, including much from the earliest years, have been preserved and are accessible to students, the materials for a history of the missions are scanty. The Franciscans of California were not men of high learning or acute observation. Their letters and records are generally devoted to mere matters of dull routine. They left no good description of the country, of the Indian manners and customs, or of their system of ruling the neophytes. Only one of their number, Francisco Palou, aspired to authorship; and his life of Serra, and his notes *(Noticias)* of the exploration and first settlement of the Territory, are decidedly inferior in literary art, as well as in fullness of information, to the works of Alfred Robinson, R. H. Dana, Commodore Wilkes, Duflot de Mofras, and Alexander Forbes, most of them travelers who had spent only brief periods in California before the American conquest.

JOHN S. HITTELL.

THE TEACHERS AT FARWELL.

Miss Bruce walked down one of the four dusty streets, dustily shaded by midsummer locust trees, that made up the town of Farwell. The sun-bonneted children across the street had no hesitation in shaping their comments on the unknown lady in gray linen according to the theory that she was the new teacher: Miss Bruce was always recognized as a teacher at the first glance. She had the worn face, the anxious expression, the constrained manners of an experienced lady teacher. She had taught school, however, but three years, and was only twenty years old; but since she had spent those three years in abject terror of school-children, parents, trustees, and principals, she passed for twenty-five. Miss Bruce never could keep a school in decent order, and was helpless before any ordinary boy; nevertheless, by one of those complete divorces between fact and theory not uncommon in the public mind, she had somehow stumbled into the reputation of being a most efficient disciplinarian, and, so much more potent is reputation than reality, she had kept it. "Get a name for rising early, and you may lie abed till noon." When she came to Farwell, some one who had known her before had summed her up by saying to Mr. Farwell:

"A regular old maid—no acquisition to your society. But she can manage any school."

The school-yard gate yawned open, and Miss Bruce entered it in full sympathy with the spirit of the Dantean inscription, and walked across the white, hard-trodden yard. A group of boys, falling back a little from her path, greeted her with a chorus of perfectly gratuitous yelling and jeering.

She had not taught school three years without learning what such a salutation meant. She looked at the impish group with dismay that amounted to a positive sense of physical illness, and thought, "A bad principal! I'm in for it now." She even conceived the possibility of retreating and throwing up her position; but, with a consciousness of necessity upon her, she walked on across the barren yard. The dead and seedy mallows in the corners looked very

Indians & Chinamen

INDIAN SOLUTION OF A DIFFICULT PROBLEM.

When the Indians in California first saw the Chinese, there arose a dispute among the former as to the country to which the latter belonged, some contending that the Chinese were an inferior race of Indians from beyond the sea; and others, with equal pertinacity, asseverating that their eyes and facial expression were utterly unlike the Indians; and that, therefore, there could be no tribal relationship between them. This question they all determined should be effectually settled, and at once; and as they were all agreed upon one point, viz., that if the new-comers *were* Indians, they could all swim; a water test was accordingly accepted as thoroughly satisfactory and conclusive to both parties.

When the spring snows were rapidly melting, and the angry streams were booming, a tree having been fallen across by which to form a foot-bridge, at an understood signal between the contestants, they met a couple of Chinamen upon this bridge; and, pushing them into the angry current, drowned them both! It is stated that this was a perfectly demonstrative settlement of the doubtful point between the contestants, and decided that *Chinamen were not Indians!* but it is not stated, authoritatively, that this process of determination was equally satisfactory to the Chinamen?

Hutchings Guide to the Yo-Semite Valley

Tattooing

Folder 2

C. Hart Merriam
Papers
BANC MSS
80/18 c

Am. Museum Journal - May 1908

PAINTINGS OF MT. PELÉ.

THE Museum is fortunate in having secured as a loan exhibit the series of eight paintings of Mt. Pelé, Martinique, made by the late Professor Angelo Heilprin of the Philadelphia Academy of Natural Sciences and Yale University, who was one of the leading geographers of the country. Professor Heilprin visited Martinique during the great eruptions of 1902 and 1903, first as the delegate of the National Geographic Society and afterward on his own account. The paintings now at the Museum were made from sketches, photographs and other studies in the field and are valuable not only from an artistic point of view, but also from their giving a record of the impressions of an observer who was a scientist as well as an artist.

The paintings have been installed in the lobby of the central hall (No. 204) of the second floor and will be of interest to those who have known Professor Heilprin personally and through the medium of his vivid printed and oral descriptions of the tragedy of Martinique that resulted from the most interesting as well as one of the most destructive volcanic eruptions of historic times.

PRESERVED TATTOOED HEADS OF THE MAORI OF NEW ZEALAND.

WHEN Captain Cook published the account of his famous first voyage around the world, which was made in 1768–1771, he described the forms of skin-decoration which he found in vogue among the natives of the South Sea Islands. Europeans had never before heard of such practices and were correspondingly astonished. Cook's rendering of the native term for the process and the result was "amoco," a word that is now written "moko." The decoration is more commonly known to us, however, as "tattooing."

The most remarkable work was found among the Maori of New Zealand and the preserved tattooed heads of the chiefs and other prominent men finally commanded such a price among souvenir collectors that many murders were committed for the sake of the heads, and in 1831 the government of Sydney, Australia, then in control over New

Zealand, prohibited the trade in Maori heads. The practice of tattooing gradually died and more than a generation has passed since it ceased to exist. The heads are now extremely scarce, hence the Museum considered itself particularly fortunate in securing last June, as noted in the October JOURNAL, the famous Robley collection. The collection comes as the gift of the late President Jesup.

Major-General G. Robley of the British army, who made a close study of the subject of tattooing while he was making his collection, states that the old-time Maori tattooer took an artist's pride in his work,

TATTOOED MAORI HEADS FROM NEW ZEALAND.

and the result, not being easily accomplished, was highly prized when completed. As may be seen from the photographs reproduced on this page the designs are intricate and really beautiful, and the skill of the artist must have been great to reproduce them with such accuracy on the uneven surface of the human face, particularly in view of the extremely tedious and painful process that was employed.

The tools used, which are represented in the collection, were narrow comb-shaped chisels made from the wing-bone of a sea-bird. The chisel was driven by tapping with a little mallet quite through the skin.

Then the tattooer rubbed into the wound a pigment made from the powdered charred resin of the "kauri" or "rimu" tree. This process left deep blue-black grooves with raised borders, and is entirely different from the method common in other parts of the world, in which needles are used and the skin left smooth. After the advent of white men in the South Seas, iron chisels took the place of the bone tools and the tattooers produced finer tracery, while the furrows left were not so deep. The illustration on this page shows two of the ancient chisels and one of

MAORI TATTOOING CHISELS AND FEEDING FUNNEL.

the carved wooden funnels that were used in feeding a man while his face was swollen by the wounds due to the tattooing.

According to General Robley, only the heads of prominent men were preserved after death. The principal object was to keep alive the memory of the dead, either of great friends or powerful enemies, and the "moko mokai," as they were called, supplied the place of statues and monumental records. In the case of a departed chieftain, his preserved

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Retake of Preceding Frame

head was a visible sign that in some mysterious way his spirit was still present among his people.

The old embalming consisted in the removal of all the interior of the head and drying in smoke after a careful steaming or even baking. The form and features were fairly kept, and the identity of the deceased was easily recognized, for the tattooing kept its place exactly on the face. A few heads retain the original eyes or have been provided with false ones; but usually the eyes of the slain were gouged out and swallowed by the victorious warrior that he might absorb the spirit of the enemy, and the eyelids were closed, since the Maori thought that they were in danger of being bewitched, if they looked into the empty orbits.

The collection is on exhibition in a case on the south side of the Peruvian Hall (No. 302 of the gallery floor).

MUSEUM NEWS NOTES.

THE MUSEUM has received through gift by C. H. Senff, Esq., a rare and valuable collection consisting of more than one hundred specimens of old Filipino knives, swords, spears, daggers, battle axes and other weapons which were collected some years ago by Capt. C. B. Hagadorn, U. S. A. This forms a most welcome addition to our ethnological series.

SINCE our last issue the following members have been elected: Life Member, Mr. ALFRED G. DALE. Annual Members, Messrs. FRANK I. COBB, GEORGE F. CANFIELD, RICHARD S. FRENCH, G. A. CRAYEN, AUGUST LEWIS and CHARLES MARTIN CLARK and Mrs. OGDEN CODMAN.

AMONG the expeditions which are in the field or are about to go out either wholly or in part for the American Museum, mention may be made of the following:

THE DEPARTMENT of Vertebrate Palæontology will continue its explorations in the Permian of Texas, in charge of Dr. E. C. Case; in the Cretaceous of Montana, in charge of Mr. Barnum Brown; in the Eocene of Wyoming, in charge of Mr. Walter Granger, and in the

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tion rates in Drosophila. The sequences and articulations are particularly felicitous as brought out by the following selected chapter heads: "Development and Heredity," "Exchanges of Matter and Energy," "Transport in the Body" (under which are treated circulation, digestion, respiration, excretion, and the structures involved), "Organic Regulation," "The Internal Environment," "The Results of Evolution: The Animal Kingdom." As might have been predicted, the authors have made a contribution of distinct value to anyone aspiring to make an entry into the field of animal biology.

S. F. LIGHT

The History of Tattooing and Its Significance, with some account of other forms of corporal marking. W. D. HAMBLY. (New York: Macmillan Company, 1927.)

Mr. Hambly has devoted three hundred and fifty pages to a rambling discussion of two theoretical points: (1) that tattooing is magico-religious in origin; and (2) that the practice of puncture tattooing was diffused over the world at a fairly late date and probably from Egypt. The bulk of the discussion is devoted to the first hypothesis, illustrated uncritically with all varieties of proof. If tattooing be found at the present time associated with myths of its divine origin or inspiration, divine patrons of the craft, priestly practitioners, puberty rites, totemism, ideas of its value in the next world, marriage rites, birth rites, war ceremonials, fertility cults, use by shamans, taboos of any sort or rituals of any sort, then its magico-religious nature is said to be demonstrated in each special instance and for the practice as a whole. Mr. Hambly is so hospitable to any evidence from any area and supplements his illustrative material with such scanty knowledge of the cultural patterns of the cultures on which he draws, that the whole argument can be dismissed as worthless.

His second thesis, the late diffusion of tattooing from one center, probably Egypt, is supported by the too familiar map in which four large P's, applied at random, show the distribution of body painting on a continent, and a completely uncritical acceptance of some of the more fantastic attempts to establish a Polynesian chronology. The hypothesis which he advances is neither proved nor disproved by such comment. (The rough map is interesting, however, in revealing the very wide distribution of the practice of chin tattooing for women.)

missible. There is nothing whatever to show these associations actually existed. With respect to the history itself, differences in culture among the islands are uniformly interpreted as the result of migrations. This is unnecessary: the world is full of instances of diffusion without migration.

There are many valuable by-products tucked away in this huge volume. Among the most striking is Dr. Hooton's analysis of the Crô-Magnon race (pp. 192–207, 261 f.). Here he speaks categorically.

> The crania which have been attributed to this "race" are more heterogeneous and variable than any "pure" racial type possibly could be. The only consistency shown by this racial type is the large size of the crania, their short, broad faces, and their chamaeconch orbits. . . . . The present writer believes that the "Cro-Magnon race" is nothing but an arbitrary selection of the extra large specimens of a fairly common, hybrid cranial form. Short, broad faces associated with dolichocephalic skull vaults are common in the crania of many peoples (p. 202).

These particular hybrids are the result of independent inheritance of the dolichocephalic head of a medium-faced race (Galley Hill, Brünn, etc.) with the broad face of a brachycephalic group (e.g., Azilians of Ofnet, Neolithics of Grenelle). It may be of interest to note that Professor Boas has made precisely the same point with respect to the modern "Crô-Magnons" of the Dordogne in the course of his lectures. There is also a suggestive discussion of the origin of the Nordic, Alpine, and Dinaric races in as many hybrid groups (p. 304 f.).

LESLIE SPIER

MISCELLANEOUS

Animal Biology. J. B. S. HALDANE and JULIAN HUXLEY. (Oxford University Press, American Branch, New York City. $2.50.)

This is the latest of the Clarendon Science Series of "readers," in which the concept of energy is made the unifying principle while the evolutionary concept is developed as a second main idea in the biological volumes. The book is both decidedly readable and thoroughly scientific and is available therefore for the general reader as well as for use as correlated reading in any introductory course in the field. It is thoroughly up-to-date, including, in the chapter on "Physiology of Development," representative samples of recent significant experimental findings and, under Methods of Evolution, reference to the very recent and most significant use of X-radiations to increase muta-

The by-products of this compendious work are no more satisfactory. There is no discussion of variations in techniques, even within the kind of tattooing which he calls puncture tattooing. Such matters as the use of stamping devices, variations in pigments, the renewal of patterns which have been distorted by growth or dimmed by age, are hardly mentioned. There is no discussion of the localization of particular ideas associated with tattooing. In only two instances, tattoo marks as identification marks in the future life in India and Indonesia, and scarification marks as signs of membership in social groups in Africa, is the material arranged so that the reader can draw any conclusions. There is no adequate study of the distribution of designs or techniques. In the case of Polynesia, where Mr. Hambly does list the different islands, he neglects to mention the important historical point of the absence of tattooing among the Moriori and in Niue.

The bibliography is far from complete. Perhaps the most conspicuous lack is the absence of any reference to the two excellent monographs on Marquesan tattooing by Mrs. Handy (Bull. B. P. Bishop Mus., vol. 1, 1923) and Von den Steinen (Die Marquesaner und ihre Kunst, vol. 1, Berlin, 1925). Conspicuous by their absence are also the painstaking summaries of tattooing in different Polynesian islands by Ling Roth in the publications of the Royal Anthropological Institute (Journal, 4: 24; 35: 283; Man, 1906, no. 4; I.A.E., 13: 198).

The discussion of art ignores the problems inherent in body decoration and the degree to which tattooing has developed or kept a style which is distinct from the local art styles, and consists instead of a series of remarks about "geometric schools" and "naturalistic schools," the illustrations culled from widely separated areas. The main service of the book rests upon the assemblage of a large body of illustrative material about the number of diverse social and religious concepts which may become associated with such an old and widely distributed practice as tattooing and its relatives, body painting and scarification.

MARGARET MEAD

Canoe Paint + For Houses

Whaka is very rich in having so many geysers, which are always intensely fascinating to visitors, some of whom sit and watch them for hours, impressed with the beauty of the steam clouds and the descending pearl-like drops which fall from the vapour like purest crystals.

Other thermal phenomena at Whaka comprise an endless variety of wonders; but one feature has always struck me more than any other. The Maori cemetery is perched on a small hillock, near the geyser plateau. It is, perhaps, 100ft. high and almost an acre in extent, with banks nearly precipitous. But these banks are steaming all over with the solfatara gases, and the place looks like a huge natural crematorium. At the bottom of the banks are numerous "flopping" mud volcanoes—fearful chasms of boiling slime and seething, bubbling mud. These are the least interesting and the most repulsive of the sights, the black and brown "coffee-pot" ones at any rate. These volcanoes or mud springs are of all colours, from a dirty black to a fine creamy hue. A nearly pure white mud volcano, said to be composed largely of magnesia, furnished the natives with an article of diet during the war times when food was scarce. They subsisted on this food for days. Right alongside this eatable volcano, separated by only a few feet, is another of an entirely different character: it is of hematite or iron ore. The ore has been reduced to putty by the solfatara gases, and, mixed with oil, it makes a most perfect paint. Strangest of all, the oil is provided by another adjoining mud volcano, whose top is covered with floating oil. This paint the Maoris use for painting their war-canoes and carved houses. In the old days they used to carry this paint to all parts of the Colony. Thus it will be seen that, however repulsive-looking these mud springs are, they serve many useful purposes. They are also used largely in reducing joints swollen by rheumatism. Sometimes patients are ordered to take a mud bath. They are rolled in the mud, and plastered with it from head to foot. They say the sensation is not unpleasant, but then they cannot see themselves as others see them. I showed one man a photograph of himself, but he secured the negative, and I cannot send you the picture.

Whaka is in every sense of the word quite a chemical storehouse. There are innumerable little lakes or ponds separated by only a few feet, and every pond of a different colour—blue, green, brown, red, yellow, black, white, etc. What their chemical constituents are, and how their waters are kept distinct as shown in their different colours, are problems for the chemist rather than the tourist.

Woodlands of New Zealand

By G. E. Alderton

Wide World Mag

Apr 1900

The Instinctive Love of Dress.

The instinctive love or ornament is as strong in the savage as in the most civilized votary of fashion. Yellow ochre and tattoo marks, feathers and beads, are his delight. So strong are these tastes that Darwin describes a South American savage as willing to work hard for a fortnight to earn money required to purchase "chica" to paint himself red.—Longman's Magazine.

Lithospermum canescens.

Puccoon.

Dye. & medicine

Lithospermum ~~longiflorum.~~ —The root yields a purple color; it is the Puccoon of the Eastern Indians.

(Palmer)

In "Indian Biography" by B. B. Thatcher Esq:- 2 vols. 1832, Page 17, says:—

"Their heads and shoulders were painted red with oyle and Puccoon mingled together formed scarlet like color.

A small root turned red by being dried and beat into powder. It was also used for swellings, aches, anointing the joints after fatigue and before painting garments. Beverly calls it Puccoon".

Puccoon root, crimson color.—
Lawson (N. C.) "Lithospermum longiflorum"

Dye Wood

260. LAWSONIA INERMIS.—This is the celebrated henna of the East. The use of the powdered leaves as a cosmetic is very general in Asia and northern Africa, the practice having descended from very remote ages, as is proved by the Egyptian mummies, the parts dyed being usually the finger and toe nails, the tips of the fingers, the palms of the hands, and soles of the feet, receiving a reddish color, considered by Oriental belles as highly ornamental. Henna is prepared by reducing the leaves to powder, and when used is made into a pasty mass with water and spread on the part to be dyed, being allowed to remain for twelve hours. The plant is known in the West Indies as Jamaica Mignonette.

Saunders Ag Dep 1891

The view up the Lete Valley was very attractive, and at this point the coolies began to get excited at the prospect of reaching the snows. They began looking up their snow-boots and blanket-coats. The women—as if their faces were not dirty enough already—smeared more brown paint round their eyes and noses as a protection against possible snow-blindness. The well-to-do Tibetans, by the way, sew coloured glasses into a band of cloth, or a close netting of black yak hair; but the poor people when crossing the snow simply daub their faces round the eyes and nose with dark pigments.

As the party pushed onwards and upwards, the altitude grew so great that Achoom began to experience trouble with his cooking. The water would not boil properly at this great height above sea level, and so the Major had to tell the distressed fellow to roast his potatoes instead of trying to boil them.

In the Tang-Ka Pass, at the height of 14,000ft., the cold was so intense, that when it was found necessary to take down the tent, and the ropes were loosened, the canvas remained standing, "frozen as stiff as a board from our breath." It had to be beaten flat with tent poles and sticks. Later on the expedition zig-zagged up a rocky way called the Tired Yak Pass. Here were seen the remains of a great landslip, and in the maze of tracks the guide pointed out the primitive device for marking the true trail—a bundle of freshly cut twigs laid lengthways on one of the diverging tracks. Had the twigs been laid crosswise it would have signified that there was "no thoroughfare" that way.

Toiling ever upward the rarefied air began to tell. Even the yaks and ponies suffered from mountain sickness. "We all had splitting headaches, nausea, palpitation, and bloodshot eyes. Frequently we had to rest through shortness of breath and that sensation which Hooker so well describes as 'having a pound of lead on the knee-caps, two pounds on the stomach, and a hoop of iron round the head!' The men bled profusely at the nose, and altogether we were in a sorry plight as we staggered into the few bleak huts of Momay (15,000ft.), the highest grazing station in Sikhim.

Coolie women smeared brown paint round their eyes and nose to protect against possible snow-blindness

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The well-to-do Tibetans sew coloured glasses into a band of cloth or a close netting of black yak hair. The poor people use the paint — great numbers in evening on account of the altitude had to roast potatoes instead of boiling — At Tang-Ka Pass on taking the tents down the canvas remained standing stiff frozen — after ropes were slacked Twigs in bundles laid lengthwise mark a true trail — Crosswise if no thoroughfare — mountain sickness

Strange sights in the
Himalayas

E. Griffiths
Wide World Mag
Dec 1899

GOOD HEALTH: A Journal of Physical and Mental Culture.

CHEMICAL TRANSFORMATIONS.

BEAUTIFUL perfumes are produced from substances not merely trivial, but in some cases fetid and repulsive. Fusel oil, putrid cheese, gas-tar, and the drainage of cow-houses, are thus transformed; the result is a triumph of chemistry; but it is commercially shabby and unfair to call perfumes thus obtained by such delightful names as "oil of pears," "oil of apples," "oil of pine-apples," "oil of grapes," "oil of cognac," "oil of bitter almonds," "eau de millefleurs." Blue dyes are made from scraps of tin, old woollen rags, and the parings of horses' hoofs. Old iron hoops are employed in ink-making; bones as a source of phosphorus for tipping Congreve matches; the dregs of port wine for making Seidlitz powders; the washings of coal-tar for producing a flavoring condiment for *blanc-mange*. Old woollen rags are the foundation of the prosperity of a certain class of manufacturers: these musty, fusty, dusty, frouzy fragments being ground up into shoddy and mungo. Other relics of old woollen garments are made to yield flock for wall-paper, padding for mattresses, and Prussian-blue for the color-makers. Chemicals are employed to destroy the cotton fibres in old worn-out balzarines, orleans, coburgs, and other mixed fabrics for ladies' dresses, and to liberate the woollen or worsted fibres for a new career of usefulness. Woollen rags, when even the shoddy-maker will have nothing to do with them, are choice materials for the farmer as manure. That bones are used for knife-handles we know very well; but it appears they are also used for bone-black by color and varnish makers, for size by dyers and cloth-finishers, and for manure by farmers. Horns and hoofs are a very magazine of useful products in the hands of the scientific chemist. Whalebone cuttings yield Prussian-blue; dogs' fat is (shamefully) made into sham cod-liver oil; wool-scourers' waste and washings reappear as beautiful stearine candles; bullocks' blood is used in refining sugar, in making animal charcoal, and in Turkey-red dyeing; ox-gall or bile is used by wool-scourers and by color-makers; fishes' eyes are used for buds in artificial flowers; bladders and intestines are made into air-tight coverings and into musical strings; all the odds and ends of leather and parchment dressing are grist to the glue-maker; calves' and sheeps' feet yield an oil which is doctored up most fragrantly by the perfumer; stinking fish is always welcome as manure to the farmer; and a brown dye is extracted from those small bedroom acquaintances whom few of us like to talk about, and none like to see or to feel. At least fifty thousand tons of cotton-waste, the residue and sweepings of the mills, are annually utilized, by being worked up into coarse sheeting, bed-covers, papier-mâché, and the commonest kinds of printing-paper. Sea-weed is used as a material for paper, as a lining material for ceilings and walls, and as a source whence the chemist can obtain iodine. Various kinds of seed, when the oil has been squeezed out of them, are useful cattle-fatteners as oil-cake. Grape husks yield a beautiful black for choice kinds of ink; raisin stalks constitute a capital clarifying agent for vinegar; bran or corn refuse is valuable in tanning, calico-printing, and tin-plate making; brewers' and distillers' grains are fattening food for cattle. Bread-raspings are in France sometimes used as a substitute for coffee, and as a tooth-powder. Tan-pit refuse is valuable for the gardener's hothouse. Damaged potatoes, and rice and grain, are made to yield starch. Ground horse-chestnuts are not unknown to the makers of cheap maccaroni and vermicelli. Cork cuttings and scraps are eagerly sought for stuffing and for buoyant purposes. Pea-shells are used as a food for milch cows, and spirit may be distilled from

them. Sawdust is now applied in a prodigious number of ways, for making paper, distilling oxalic acid, smoking fish, clearing jewellery, filling scent-bags, stuffing dolls, etc. Tobacco-ashes are made into tooth-powder. The coal-tar from gas-works is made to yield sulphate of ammonia, sal-ammoniac, printers' ink, lampblack, disinfectants, naphtha, benzole, paraffin, and the magnificent series of aniline colors for dyeing and calico-printing. The sediment in wine-casks is made into cream of tartar. Old kicked-off horse-shoe nails yield the best of all iron for musket-barrels. As for the shops in which gold-workers, jewellers, and goldbeaters work, not only is the very dust on the floor precious, but a refiner will gladly give a new waistcoat or apron for an old one, for the sake of the particles thereby obtained.

Horse-flesh is certainly not waste so long as dogs and cats eagerly feed upon it; but the French say that we ought not to leave it to the dogs and cats, by reason of the excellent qualities it possesses for human food; however, we must leave this matter to the hippophagic admirers of "chevaline." Fish are applied to many more useful purposes than was customary a few years ago: shark fins are prized as food by the Chinese; shark liver is boiled down by them for oil; shark skin is dried and used for polishing wood and ivory; dried shark heads are given by the Norwegians to cattle as food; smoked and dried dog-fish is eaten as food, as are also the eggs, while the skin and the liver are applied to the same purposes as those of the shark. The French procure useful medicinal oil from the liver of the skate, which used to be thrown away, but which is now found to be nearly as efficacious as cod-liver oil. A French firm make large quantities of useful tallow or fat out of the pickings and waste of slaughter-houses, the dead cats and dogs found floating in the Seine, and the used-up grease of railway wheels; when doctored by means of steam and hydraulic pressure, this fat becomes available for stearine manufacturers. Leather scraps are made into "shoddy leather," by grinding and macerating them into a pulp available for the inner soles of shoes and such-like purposes. There is another leathery composition much used, under the name of "pancake." Thin bits of leather, the odds and ends cut off by the tanner and currier from whole hides, are interlaid with paste until they accumulate to an inch in thickness, and then heavily squeezed between two iron rollers; the mass comes out as an oblong pancake twelve inches by four, and half an inch thick, looking very much "like a cross between a sheet of gingerbread and a cake of tobacco;" it is used for inner soles, heels, and stiffeners. The albumenized paper used by photographers is subject to much waste in its manufacture; this waste, instead of being consigned to the pulp-vat, is now converted into beautiful marbled paper, by a peculiar application of aniline colors to the albumen.

We are told that the using up of what was formerly considered waste, in the textile manufactures, now reaches the enormous quantity of a hundred thousand tons annually, in the three forms of cotton, flax, and hemp waste. If we include animal fibres, such as shoddy wool and silk waste, the aggregate becomes largely increased. The French make firewood or firelighters of the cones of pine-trees and the waste cobs of maize or Indian corn, saturated with any cheap resinous substance. Messrs. Souffrie buy all the waste and pickings of vegetables from the twenty-five hospitals of Paris, cook them by steam, and feed a piggery of seven hundred head of swine—the vegetables being enriched with the greasy slops from the same hospitals. The same firm also produce beautiful white fat from the black residue left after purifying colza or rape oil; and another residue from the treatment of *this* residue gives them a useful varnish for cheap out-door purposes. The oil retained in olive oil-cake is now extracted by chemical means, and converted into capital stearine; and by this improvement it is expected that seven million

pounds of olive oil, now annually wasted at Marseilles, will be utilized. Old account-books, letters, invoices, envelopes, checks, insurance-policies, and other kinds of paper, are now bought and worked up with other materials into pulp for the newspapers. Besides linen and cotton rags, cotton-waste, old writing-paper, straw, and esparto, or Spanish grass, wood is also now much used for making into paper. Large factories for this purpose have been established in this, and other countries; the wood is rubbed down into dust by friction against rapidly revolving roughened wheels, and then treated by chemical processes until it forms a pulp suitable for paper-making. There is one wood-pulp paper-mill in Pennsylvania that can work up thirty thousand pounds of wood or of sawdust per day. Nearly all the newspapers now have a percentage of wood in the paper on which they are printed. A New York daily is said to be printed on paper made of bamboo; and other journals are printed on paper made chiefly of a kind of wild cane that is found in vast abundance on the shores of the Mississippi.

A German chemist has found a mode of distilling spirit out of a residue left after chemically treating wood-pulp for paper. A French manufacturer converts sawdust, by intense pressure, into beautiful little boxes and other ornamental articles. The seed in the cotton pods or tufts, which used to be an annoyance to the cultivators, is now most usefully employed as a gas-fuel, as a source of oil for lamps, as a chief substitute for olive oil, as oil-cake for cattle-food, and as a source of good hard grease or stearine for soap and candles. The refuse molasses from beet-root sugar, formerly used only as pig-food, are now distilled to obtain alcohol, and the residue crystallized to obtain potassium salts. Spent dye-woods, after the coloring matter has been extracted from them, are sold in France to a large manufacturer, who mixes them with tar refuse, and forms them into compressed cakes for fuel, which has a very large sale. The acicular leaflets of the pine-tree are converted into what is called tree-wool, in France, Sweden, Holland, and other parts of the continent; this wool is used for wadding, stuffing for mattresses, and other articles of furniture; a cloth made from its fibres is used for inner vests, drawers, hose, shirts, coverlets, and chest-preservers; the membranous fragments and refuse are compressed into blocks for fuel; the resinous matter contained in them is distilled for gas; while by various modes of treatment there are produced an essential oil for rheumatism and skin diseases, an ethereal oil useful as a curative agent and as a solvent, and a liquid for a medicated bath — all useful substances, from a material which not long ago was utterly disregarded.

Near Charleroi, Belgium, eight hundred thousand tons of coal-dust had accumulated, a burden to the colliery owners, and an injury to the health of the workpeople. Whereupon a Company was formed expressly to utilize this refuse. The coal-dust is sifted, mixed with eight per cent. of coal-tar, heated to a paste by steam at a temperature of three hundred degrees, and pressed into blocks and cylinders about twenty pounds weight. These blocks form excellent fuel for locomotives and steamboats, productive of great heat and very little ash. In various foreign countries where paving-stone is scarce, the slag from iron furnaces is brought into use, by being run into pits eight or nine feet in diameter, and cooled into slabs for paving. The cuttings of tin-plate, and worn-out tin kettles and saucepans, are subjected to processes which yield pure tin, good weldable iron, ammonia, Prussian-blue, and stannate of sodium; and as the make of tin-plate amounts to more than half a million tons annually, there must be a very large store of material available in the old tin-plate which is replaced by the new. The waste flux, such as borax, used in galvanizing metals, finds a ready market among refiners, and for making paint.

But there are mounds of things still waiting to be utilized, waiting for the day when some clear, practical minds will find out what to do with them.

VINEGAR.

OF all the vegetable acids (and they may be numbered by hundreds), none takes equal rank for general importance with vinegar. The extensive use to which we apply it in our every-day life, vinegar from the cruet as a simple condiment, as a liquid for pickling, and for salad dressings, would teach us, if we did not know already, the extreme utility of vinegar for domestic purposes. If, passing beyond the region of our hearths and homes, we wander to the domains of manufacture, then vinegar, or what amounts nearly to the same thing, but not *quite* the same, acetic acid, will be found to have extensive applications. Thus, for example, calico printers use an immense quantity of it in various ways; so, in like manner, do the dyers. Acetic acid and vinegar are almost the same, though not quite the same, as was just now stated. The difference admits of being succinctly explained. Whereas acetic acid is the sour principle of vinegar alone, vinegar is a mixture of the sour principle with another thing or other things that impart special flavor. Almost every one knows, for example, that French cruet vinegar has a distinctive taste, whereby it is easily known from English cruet vinegar, the reason being that whereas French vinegar is the product of a fermentation of wine, English vinegar is the product of certain other things, wine not being one. What the precise things are used in the manufacture of English cruet vinegar I shall not now stop to explain. Hereafter they will come prominently under consideration. Whatever thing holds sugar as a constituent, may be made to yield vinegar; and if out of vinegar, no matter how or whence obtained, we extract the sour portion, leaving all else behind, then the sour reduct is properly called acetic acid. I have said that whatever thing holds sugar, as a constituent, may be made to yield vinegar, and indeed whenever fermentation is had recourse to for manufacturing vinegar it is sugar from which the acid originally comes; not only sugar, but one particular sort of sugar—that known to chemists as grape sugar, or glucose. This statement at first seems inconsistent with the fact that if we dissolve ordinary or cane sugar in water, add a little ferment, and expose the whole for some days to a moderate temperature, vinegar is in the end developed. Chemistry teaches us that the result is not so simple as it appears, the fact being that our ordinary or cane sugar first changes to grape sugar, this next to alcohol, or intoxicating spirit, and the latter to acetic acid. As the fermentation of saccharine, or else alcoholic bodies, was the most ancient source of acetic acid, so it still remains the chief. The distillation of wood is another means of acetic acid production. Originally the term pyroligneous acid was applied to acetic acid obtained from this source, but early in the present century its identity with acetic acid was established. Besides these two sources of fermentation, and wood distillation, chemists are able to produce acetic acid by certain refined processes of their own; these, however, have no commercial value.

Acetic acid has much antiquarian and chemical interest. Familiar to man from the most ancient times, it has ever been appreciated for its condimentary value. Mixed with water, it was much used as a drink by ancient Roman soldiers. A prejudice, but seemingly unfounded, lies against vinegar in this country as a drink. Vinegar and water would appear to be a wholly unobjectionable beverage, and moreover agreeable. To illustrate the chemical interest attached to acetic acid, let us just contemplate the following. Notwithstanding acetic acid, more or less colored and flavored — in other words, vinegar — is evolved from vegetable matters as a result of fermentation, yet its presence in original vegetable matters is most rare. Thus some grapes are sweet and some grapes are sour, but whenever the problem is to evolve vinegar from grape juice, a chemist well knows he must use the

sweet ones. The sourness of sour grapes does not depend on acetic acid — or the sour element of vinegar — at all, but mostly on the presence of tartaric acid. The simplest proof is, that whereas the sour part of vinegar can be distilled over, constituting distilled vinegar, the sour part of sour grape-juice cannot. Sometimes we may have heard expatiated upon as a curious fact that sugar should be capable of yielding vinegar. Very slight chemical study explains the wonder, or rather sets it aside as being no wonder at all, when we reflect that both sugar and acetic acid are made up of the same elements — carbon, hydrogen, and oxygen, only in different proportions. The fact is not so popularly known — if it were, the wonder would seem greater than in the last case — that oxalic acid is also a derivative from sugar, or now more usually from sawdust, the chemical constitution of which last is almost identical with that of grape sugar.

In the cider districts, excellent vinegar is prepared by the acetous fermentation of cider. If, instead of cider, beer be taken, and acetous fermentation induced by proper means, beer vinegar results, the flavor of which is not so agreeable as in the first case, because the flavoring matters of beer itself are less agreeable than those of cider. The colored vinegar of commerce is made in a different way, the fundamental principle still holding good that either sugar or alcohol, a derivative from sugar, must be taken to begin with. The vinegar makers operate upon malt wort — that is to say, unfermented beer, without hops, to develop their vinegar, and using common rasins to impart an agreeable flavor. Traces of oil of vitriol are almost always discoverable in ordinary colored vinegar, on the addition of proper tests. About twenty years ago, a curious, and, to first semblance, an alarming discussion took place relative to the presence of arsenic in certain specimens of vinegar. Undoubtedly, many specimens of oil of vitriol do hold arsenic, and if such be used for mingling with vinegar, then of necessity the mingled vinegar must contain arsenic within the meaning of chemistry. Undoubtedly adulteration is a very bad thing, but still undoubtedly the word adulteration has been too frequently used as a cry of terror by two different classes of persons, one well aware of the mere shadows of things chemical analysis is capable of revealing, the other not so aware — men to whom a mere name is all in all — to whom the word arsenic, whether referring to a ghost, so to speak, of the ten-millionth part of a grain of arsenic or an ounce of the same, would convey the same idea. We need not be afraid of such ghosts of arsenic as may be revealed in certain specimens of vinegar, nearly so much as of the lead and the copper which may be present, never purposely or by adulteration, but as the result of accident. When I say that copper never exists in vinegar as a purposely added contamination, we must of course exclude certain green pickles, and restrict ourselves to vinegar alone, as from the cruet.

Though considerable quantities of vinegar have been made from time immemorial from cider and beer, and made domestically without any sort of mystery, yet the special vinegar manufacture from wort was long held in secrecy. So valuable was the concealment in the estimation of vinegar-makers, that the workmen employed were sworn not to divulge what they knew. The progress of chemistry has terminated this state of things; the general principles that must guide the manufacturer are quite well understood; points of detail there may indeed be, as in all manufactures there are, but here, as in other similar cases, science has unshrouded special trade secrets.

The production of vinegar by fermentation involves, as all know fermentations do involve, the development of low forms of organic life. Whenever wine, beer, cider, etc., change to vinegar, a thick, ropy, gelatinous-looking mass, commonly known as mother of vinegar, forms in the liquid. This "mother" has the property of setting up and accelerating the acetous fermentation in suitable fluids, which, but for the presence of this substance,

would have had to wait a long time. For an explanation of the nature of this mother of vinegar, science is indebted to the microscopists. The glairy mass is a vegetable growth, a vegetable of low vitality, to which the appellation *Mycroderma aceti* has been given. Being developed, it floats on the surface of the liquid, first absorbing atmospheric oxygen, then giving it up to the alcohol, which, owing to this accession, is converted into acetic acid. This is a convenient opportunity for stating some particulars about fermentation in general. The decompositions thus designated are very dissimilar to ordinary chemical decompositions, and until within the last twenty years their general nature was wholly misapprehended. Many organic bodies are capable of fermentation of one or other kind, when brought into the presence of certain complicated bodies called ferments; thus arise many products differing according to the nature of the substance acted upon and the ferment used. The agency of some living organism, however, animal or vegetable, as already explained, is always necessary in every case of fermentation. Thus we have our ferment yeast, which sets up the spirituous fermentation, another which generates the lactic fermentation, a third the acetous. Most of the ferments are vegetables, but one, at least,—that causing the butyric fermentation,—is an animal, and this, wonderful to relate, cannot live in free oxygen, the gas which, breathed by ourselves and the higher animals, alone supports vitality, but thrives in an atmosphere of hydrogen.

The pure, undiluted, unmixed, sour principle of vinegar,—acetid acid, that is to say,—is seldom met with out of chemical laboratories, and is not always to be found there. Pure acetic acid is a transparent crystalline, solid at low temperature, almost as destructive to the skin as so much oil of vitriol or aquafortis would be. The nearest approach to actual acetic acid with which non-professional people make acquaintance is aromatic vinegar, a fluid which may be considered as acetic acid nearly deprived of water, and charged with agreeable odorous matters.

Vinegar being a liquid in such common domestic use, and coming necessarily in contact with ordinary household surfaces, it becomes a question of importance to decide what materials are dissolved by it, and what are not dissolved; further, whether the solutions thus resulting are poisonous or innocuous. Upon lead and copper, vinegar, whether colored or colorless, and in all conditions of strength, acts with rapidity, forming a sweet result called on that account sugar of lead, a compound highly poisonous to man and animals, though it has been stated spiders eat it with impunity, and seeming relish. The lead contamination of vinegar is all the more dangerous that its taste is not disagreeable, and being colorless, is not manifest to the eye without testing. Copper is another metal upon which vinegar speedily acts, generating acetate of copper, or verdigris, a substance of green hue, and violently poisonous. Upon iron, vinegar acts, forming acetate of iron, a compound which, for the small quantities possible to be swallowed, may be considered innocuous. The taste, however, is offensive, as need hardly be impressed upon any one who, having dabbled about a sour salad with an iron knife or fork, and afterwards eaten the salad, can testify. Even the natural juices of salad-making vegetables dissolve so perceptible an amount of iron, that folks particular as to the flavor of their salad never cut their herbs, but pull them to pieces with finger and thumb. Imitation silver forks are also easily attacked by vinegar; indeed, if we pass in review the domestic metals, silver will be found the only one that is not so attacked. I even know a manufacturer who, producing distilled vinegar on the large scale, uses a silver still head and refrigerator for his trade purposes. If a polished iron surface, such as a knife-blade, be immersed for a few minutes in vinegar which holds copper, dissolved metallic copper will be deposited; and if hartshorn be added to another portion of the copper-

The Mound outside the Rajah's house, round which the Head-hunting dances take place —

HERE YOU SEE THE MOUND OUTSIDE THE RAJAH'S HOUSE, ROUND WHICH THE HEAD-HUNTING DANCES TAKE PLACE. [*From a Photo. by the Author.*

Room where rice is husked - the table being made from one great tree trunk in one piece

Young men's quarters

The next house, some hundred yards long, appeared to have loose boxes on either hand. Those turned out to be the married quarters. We were not allowed to look into any of these; perhaps it was as well. Passing along the broad dark passage, we reached the daylight at the other end, and were shown where the women husked the "dhan," or rice. A table occupied one side of the room. It was made out of one great tree trunk, the whole table being in one piece. The labour in making it must have been enormous. It was about 20ft. long, 3ft. high, and over 3ft. broad. From this room we went on to the young men's quarters. Here we saw the great gong used on special occasions. It was the hollow trunk of a tree some 18ft. long. The hammer was merely a large chunk of wood. The sound is very deep, and can be heard for miles. The Secretary then remarked he had something really worth our notice. He seemed pleased. We went to the end of the building.

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Rev. E. M. Hadow

of Cirencester

Upper Assam

Wide World May.

Rows of Human Skulls — each one a Separate tragedy

Imagine a stand of several shelves such as you see in greenhouses. No pots of flowers were on these stands, gentle reader, but instead, there were rows and rows of *grinning human skulls*, each skull a separate tragedy! What, think you, is their history? Well, some were obtained in fair and open fight; some by midnight raid on a hostile tribe. But the greater number? Well, look at these skulls with me, and I will tell you a story. You will notice they all have holes *at the back of the head.* Take this skull. It belonged to a man once who went one morning to his work, little suspecting danger. He worked in his rice-field all day without a thought that gleaming eyes watched him from the jungle.

Evening came on, and he gave up work for the day, and started on his way home. He reached the jungle path, already gloomy in the fading light. An owl hooted; the fever bird shouted, "You're ill! You're ill! You're ill!" But what was that other noise he heard? Oh! nothing. Only a pheasant scratching among the dead leaves. And again! Oh! only a deer moving at the side of the path. Suddenly a crushing blow. He staggers, drunkenly; yet another, and he falls. All day long a young man had been watching the worker. The young man does not know and has no grudge against his victim. But just as boys at home collect butterflies and moths, the young man must collect human heads. He must earn his tattoo marks and have the envied symbol on his arm. He only wants the head. If the rest of the body could live without it he would not mind. You throw up your hands and say, "What brutality! What treachery!" Well, I do not know that we are much more civilized; we lie low and injure reputations instead of heads. The lasting damage in both cases is equal. Well, to return. The young man "collects" his head and takes it to his Chung, where a big dinner is given, followed by a dance. The dance takes place round an artificial mound outside the Rajah's house, the head being placed on a long pole. Every "hero" who brings in a head must throw a slab of stone on to the mound. Look at the number there are. The Secretary of State mentioned, however, with tears in his eyes, that last year the skull crop had been very short. It was deplorable. They were hoping for a better season this year. There were 170 skulls on the shelves we were looking at. The young man who starts skull-collecting is not at all particular what he begins with. "You haven't killed a man?" said a planter, to a small, newly-tattooed Naga boy. "Oh, no," was the reply; "but I killed an old woman and a baby!"

Head-hunting like hunting Insurgents — Feast & Dance given to successful Hunter —

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Imagine a stand of several shelves such as you see in greenhouses. No pots of flowers were on these stands, gentle reader, but instead, there were rows and rows of *grinning human skulls*, each skull a separate tragedy! What, think you, is their history? Well, some were obtained in fair and open fight; some by midnight raid on a hostile tribe. But the greater number? Well, look at these skulls with me, and I will tell you a story. You will notice they all have holes *at the back of the head*. Take this skull. It belonged to a man once who went one morning to his work, little suspecting danger. He worked in his rice-field all day without a thought that gleaming eyes watched him from the jungle.

Head-hunting like hunting Butterflies — Feast & Dance given to successful Hunter —

Evening came on, and he gave up work for the day, and started on his way home. He reached the jungle path, already gloomy in the fading light. An owl hooted; the fever bird shouted, "You're ill! You're ill! You're ill!" But what was that other noise he heard? Oh! nothing. Only a pheasant scratching among the dead leaves. And again! Oh! only a deer moving at the side of the path. Suddenly a crushing blow. He staggers, drunkenly; yet another, and he falls. All day long a young man had been watching the worker. The young man does not know and has no grudge against his victim. But just as boys at home collect butterflies and moths, the young man must collect human heads. He must earn his tattoo marks and have the envied symbol on his arm. He only wants the head. If the rest of the body could live without it he would not mind. You throw up your hands and say, "What brutality! What treachery!" Well, I do not know that we are much more civilized; we lie low and injure reputations instead of heads. The lasting damage in both cases is equal. Well, to return. The young man "collects" his head and takes it to his Chung, where a big dinner is given, followed by a dance. The dance takes place round an artificial mound outside the Rajah's house, the head being placed on a long pole. Every "hero" who brings in a head must throw a slab of stone on to the mound. Look at the number there are. The Secretary of State mentioned, however, with tears in his eyes, that last year the skull crop had been very short. It was deplorable. They were hoping for a better season this year. There were 170 skulls on the shelves we were looking at. The young man who starts skull-collecting is not at all particular what he begins with. "You haven't killed a man?" said a planter, to a small, newly-tattooed Naga boy. "Oh, no," was the reply; "but I killed an old woman and a baby!"

Our Racial Inca Land
Rev E. M. Tadoro of
Cinnamara Upper Indian
Wide World Mag Mar 1900

Fiji Needed.

Paint & Ornaments
New Guinea

They often paint their faces with charcoal, and also with yellow paint. A young man with his face painted, his hair done up chignon-fashion, two armlets on, and a long stone through his nose, is in full dress, and fit for any evening party. The men wear their hair long, but the women have theirs cut off quite short.

Missionary Advocate.
Jan 1876

THE TATTOOING PRACTICE.

Two Artists Who Excel in Adorning Human Bodies.

(From the New York Commercial Advertiser.)

In England and America today tattooing has become a fine art, in which two of its professors at least have attained an excellence that has occasioned much comment from the French press. Tattooing has been practiced for generations by races of the most widely divergent ethnical characteristics. Savage and civilized peoples, the Laplander, like the redskin and the negro, furnish striking examples of this fact. The custom had at first diverse objects, and was frequently used as a simple religious ceremony during the Middle Ages by the Christian as well as the pagan world. The simple cross that was tattooed upon the pilgrim's arm at various shrines gradually developed into some religious painting. Mr. Sutherland Macdonald achieved marvelous success in this branch with his copy of the Veronica Christ head, in which he has reproduced the agony of expression with marvelous fidelity.

Tattooing was, however, more frequently employed as a means of ornamentation, and it is this characteristic which it has retained today among civilized nations. It is worthy of comment that wherever it is practiced it is confined almost exclusively to the male sex. In the Samoan islands the men alone are decorated in this fashion, while the chiefs in the Polynesian archipelago are covered from head to foot with graceful arabesques, their women allow their hands only to be tattooed, somewhat in the fashion of a glove or a mitten.

Formerly tattooing was resorted to solely by those who desired to exhibit themselves in public museums, etc., and the Ridley brothers were at one time considered the sole experts in this art. But the exquisite finish of some of the designs have attracted many of the richer classes, as in London, where nearly all the nobility passed through the hands of the tattooer before embarking for the Transvaal, a crest, the regimental insignia and St. George and the dragon being the favorite designs.

The vogue thus given in America to tattooing is due mainly to the efforts of Hori Chyo, a Japanese native of Yokohama, who has settled in New York. He combines various shades of brown with the deep blues and reds of the earlier days, and, thanks to his knowledge of the rules of perspective, has produced some beautiful work. He excels in animal painting, if the term be allowed in this sense, one of his attendants bearing on his forehead, it is said, a lizard so lifelike in appearance that no fly dare approach it. Hori Chyo boasts one royal personage among his clients, the present czar of Russia having visited him during his Oriental tour before his accession to the throne. Hori Chyo's studio is open to all visitors, whether they come as clients or merely as spectators of his dexterity in handling the sharp stylets. With nervous patients he uses a hypodermic syringe, which reduces the pain to the mere sensation of a scratch.

Mr. Macdonald, of London, however, enjoys the distinction of having brought the art of tattooing to the highest degree of perfection yet achieved. He has perfected a system of coloring by means of which he introduces magnificent blues and greens into his work with delightful effect, and is at present experimenting with yellow and bluish lavender, when he will have all the colors of the rainbow at his command. His stylets are of the finest-tempered steel and he uses the most approved antiseptic precautions that modern science has placed at his disposal. He has just patented an electrical appliance by means of which he works five times more rapidly, and, it may be added, with infinitely less suffering as the result.

Among his many celebrated clients he counts the Marquis of Salisbury's son, the Duke of York, Princess Christian of Denmark, Victor von Hohenlohe and Vladimir Orloff, of St. Petersburg.

Tuesday Jan 29
1900

Jalisco

Colomo Sagittaria sagittifolia

La naturaleza vol 4 P. 85 mex Pl

KORAK BEAU.

KORAK BELLE.

This was our first encounter with those "savage Koraks," who, we had been told, would be ready to murder us for the smallest possible plunder. These, however, belonged to the civilized Koraks, who differ little, except in being more dirty, from other natives of the region. The beaux, however, shave the crowns of their heads, leaving the remainder of the hair hanging in a circular fringe, giving them the aspect of monks, while the belles heighten their charms by tattooing. We found them good-natured and hospitable. There are two classes of pagan Koraks — the one living near the sea, and subsisting mainly upon its products; the other, in the interior, called Reindeer Koraks, are nomads, and have immense herds of deer. In many respects they resemble the Bedouin Arabs. From the best accounts we could get they are usually hospitable, although there are recorded instances of treachery on their part.

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Reindeer Dogs + Snow Shoes
Siberian Travel + Exploration
Harpers Oct 1871

Anatto
Arnatto

Bixa. Orellana.

Painted Indians Brazil

Arekunas inhabit the
mountains and savannas
on the sources of the Rivers
Caroni Cuyuni and Mazaruni
Had their whole body in-
cluding the hair painted
red with Arnatto

Brandt

Indian, Red Color

Bixa Orellana Lin from the
seeds
of this plant which are cove
red with an orange red waxen
pulp or pellicle, and which
is depera ted by washing.

The Indians prepare the red
color known as Arnotto, for
painting their bodies

British Boundary Expedi
tion to Guiana Richard Sch
omburgk R. D. Phil Director

Negritos Of The Philippines
Tatto With Bamboo needles

The tattooing of their bodies is done with a sharp splinter of bamboo.

Two Republics Manila
Sept 26-1900

New Zealand

Tawhaio, Maori King.

TAWHAIO, MAORI KING.

TAWHAIO, MAORI KING.

Hearth Map Aug 1791

Source of Color.

From the Industrial World.

The sources of color used in the arts is given as follows: The cochineal insects furnish the gorgeous carmine, crimson, scarlet and carmine lakes; the cuttle fish gives sepia, which is the inky fluid which the fish discharges when attacked; Indian yellow comes from the camel; ivory chips produce the ivory black and bone black; the exquisite Prussian blue comes from fusing horses' hoofs and other animal matter with impure potassium carbonate; various lakes are derived from roots, barks and gums; blue black comes from the charcoal of the vine stock; Turkey red is made from the madder plant, which grows in Hindostan; the yellow sap of a Siam tree produces gamboge, while raw senna is the natural earth from the neighborhood of Sienna, Italy, and raw umber is an earth found near Umbria. India ink is made from the burnt camphor; mastic is made from the gum of the mastic tree, which grows in the Grecian Archipelago. Bistre is the soot of wood ashes; very little ultramine—obtained from the precious lapis lazuli—is found in the market. Chinese white is zinc; scarlet is iodide of mercury, and vermilion is from quicksilver ore.

Sm Rep 1863

PURPLE DYEING, ANCIENT AND MODERN.

TRANSLATED FOR THE SMITHSONIAN INSTITUTION FROM THE GERMAN PERIODICAL, "AUS DER NATUR," &c.

THE idolatry of classical antiquity finds its chief antagonism in the natural sciences. It would be easy to show how many illusions, nestling in the heads of the admirers of the olden time, have been dispelled by modern chemistry alone; and, although our present purpose is to deal with two objects of subordinate importance, yet these also serve to show how very broad is the line of separation between our own times and the remote ages, to whose languages and ideas so much of the time and training of our youth are commonly devoted.

The colors of *azure* and *purple* were among the most highly priced as well as the most highly prized productions of antiquity. The former was sold for its weight in gold, and the latter was especially reserved for the noble and the powerful; its use was in some ages even forbidden to all beneath those of the highest rank on pain of death. Science and art have wrought here a striking change; being no longer limited to the direct gifts of nature, we are able, from the most apparently unpromising raw material, to furnish for the use of the whole community what could then be but scantily produced for the ruling few The contrast is certainly suggestive.

As early as three hundred and fifteen years before the Christian era, Theophrastus drew a distinction between natural and artificial azure, the latter of which, he tells us, was manufactured in Egypt. It seems most probable, however, that the terms natural and artificial indicate in this case only the greater or the less degree of care with which the color was prepared from the beautiful stone which we call *Lapis lazuli*, to which the ancients gave the name of sapphire. While in some cases the stone was merely reduced to a fine powder, in others, probably, the coloring matter was more carefully separated, as is done in our own day.

The Lapis lazuli, or sapphire, is found in the least accessible parts of Little Bucharest, Thibet, China, and Siberia, in layers or strata of granite or limestone. Of old, as at the present day, it was polished and wrought as a gem, and it is almost the only member of the large family of gems that has an intrinsic value. This distinction it owes to the fact that, in addition to its great beauty, it yields for the use of the painter one of his most beautiful colors, which, moreover, is unaffected by air or heat; that color is ultramarine.

As lately as the commencement of the present century, ultramarine, or azure blue, was not simply a fine powder of the gem, but the result of a long and troublesome process. The stone was first broken into small pieces, and even this first step in the process was no easy one, the stone being exceedingly hard. The pieces, of the size of a hazelnut, were cleaned by means of lukewarm water, then made red-hot, and afterwards slacked in a mixture of water and acetic acid. The cohesion of the particles is so great that this process must be repeated from six to ten times before the mineral can be transformed into a fine powder. It is afterwards rendered still finer by trituration with the muller stone of the painter, having been first mixed with water, honey, and dragon's blood, then treated with the ley of the ashes of the grapevine, and finally dried. The powder is next compounded into a mass with turpentine, rosin, wax, and linseed oil,

melted together, and kneaded under water. By this process the fine powder is washed out, and in time sinks as a sediment in the liquid. The mineral yields not more than one-fourth of its weight of coloring material.

Up to a very recent time Italy continued to be the chief, as it had been the original, manufactory of ultramarine, and thence the finest shades were derived. The tediousness, the difficulty, and, consequently, the costliness in both time and money of the old process of producing ultramarine from the Lapis lazuli, naturally excited great desire among scientific chemists to find some cheaper and readier artificial means of producing that color, doubly precious to the painter for its beauty and its permanency; but so invariable from different causes were the failures of all attempts in that direction that the solution of the problem was well nigh despaired of, when hope was as suddenly as accidentally revived. In 1818 it happened that in France a sandstone furnace for the melting of soda was taken down, and a beautiful colored substance, never seen there before, was discovered. It was remarked, that formerly the furnace for the melting of soda had always been constructed, not of sandstone, but of brick. The mass of matter thus discovered was examined by Vauquelin, who observed in its appearance and composition points of great resemblance with ultramarine; but still no clue offered itself to guide him through the perplexities of the investigation. Similar observations were made in other soda manufactories, as, for instance, by Hermann, in Schöubeck, who had thrown away above a hundred weight of the colored mass found in a similar furnace when the latter was pulled down; and by Kuhlmann, at Lille. We shall not venture to decide whether or not the "blue material," mentioned by Göethe in his "Italian Travels," (1781,) as being taken from limekilns in Sicily, and used for the adornment of altars and other objects, was homogeneous with this product of the soda furnace, and whether both were, in fact, an artificially and accidentally produced ultramarine.

The question still remained unanswered, how was this substance in the case of each furnace produced? In what did it originate? At length, in 1828, the solution of this important question was found and published by Professor C. Gmelin, of Tuebingen. During eighteen years he had been occupied with researches on the "Lapis lazuli" and its kindred minerals, the products of the volcanic eruptions of Vesuvius. Reflecting on the recent circumstance, he was led to believe that, notwithstanding there had been so many unsuccessful attempts, the production of an artificial ultramarine was not an impossibility. Further study of the natural coloring substance disclosed to him the sulphurous portion of the components, and holding that clue he at length succeeded in producing a most brilliant ultramarine.

At about the same time, another German chemist, the well-known "Doebereiner," had a glimpse of the true nature of the coloring principle of ultramarine. He was the first positively to assert that it was to be attributed to sulphur alone. He obtained, however, a mere glimpse of this beautiful discovery, other occupations preventing him from following it up. A very few more experiments, and he would have been completely in possession of it. Gmelin was scarcely more successful, though the absence of this additional jewel in his scientific crown was owing to a different cause. It is not in the nature of a true savant to place his talent at usury, or, in plainer terms, "to make money by it;" though now and then doubtless, in these days of extravagant projects, it is not impossible to find a savant at the head of some speculating manufactory, to the success of which his reputation gives a substantial guarantee. Men of science of this kind are certainly much sought after by industrial speculators, yet the exceptions do not greatly affect my assertion as to the general disinterestedness in this respect of the German savant.* He, for the most part, when, in the

* This characteristic is by no means confined to German savants, but is shared by most men of science in all countries.

course of his researches and experiments, a discovery has been made which may be rendered available for utilitarian purposes, forbears to make a secret of it, publishes it without reserve, and leaves the pecuniary harvest, large or small, to be reaped by others. Is this because the enthusiastic savant has so little worldly wisdom, or so exclusive a desire of reputation? Gmelin's own words may, perhaps, help the reader in forming a reply to this question. He says: "I have thus mentioned all the circumstances which must be kept in view in the manufacture of artificial ultramarine, and I have also added some hints for the use of those who may make it their object to manufacture this color on a larger scale. I have now only to desire that others in like manner may unreservedly publish their experience on the subject, so that the production of this article may, as early as possible, attain to the highest degree of perfection. We cannot, it is true, when an important technical discovery has been made, which promises large profits, fairly blame any one for keeping it a secret until he has achieved that great and justifiable aim of all mankind, security against want; but beyond this, no one has a right to maintain secrecy that he may secure gain. And it is very much to be regretted that by the withholding of so many discoveries (often buried with those who make and conceal them) science has been hindered in its progress, and an obstacle thrown in the way of the noblest object of man, that, namely, of increasing knowledge and diffusing civilization." Such, literally, was the practice of Gmelin. While at Paris, in 1827, and previous to the publication of his discovery, he unreservedly communicated his ideas on the artificial production of ultramarine to several chemists, especially to Gay Lussac. And, behold! on the 4th of February, 1828, Gay Lussac made a report to the French Academy that Guimet, at Toulouse, had succeeded in manufacturing ultramarine of all kinds. Did the discovery originate in the open and disinterested communication of Gmelin, or did it not? Who shall decide? Guimet, it is but just to say, warmly defended himself against such a suspicion; he affirms that he was prompted to his experiments by the examinations of *Lapis lazuli*, made by Desormes and Clement, and claims that he had produced artificial ultramarine before Gmelin's visit to Paris.

Whether the method of Guimet is essentially different from that of Gmelin cannot be determined, for, while the latter published his discoveries with every particular, Guimet, on the contrary, has kept his method a secret to the present day. In so far as profit is concerned, Guimet, it must be confessed, has maintained the advantage over Gmelin, and France over Germany; for Guimet forthwith made his discovery lucrative to himself and others. As early even as the same year, 1828, he had erected a manufactory at Paris for the production of artificial ultramarine, which he sold at two dollars and sixty-six and a half cents per pound, while the natural article was a little more than double that price. Guimet succeeded in having his product adopted for the painting of the beautiful ceilings of the museum of Charles X, and thenceforth his fortune was made. In 1834 the price had risen to from four to five and one-third dollars per pound, but in 1844 had again fallen, and ranged from two and one-sixth to two and one-third per pound, though the best quality for oil painting was still sold at six dollars and forty cents. The cheapness of the ordinary article enhanced the demand, and the product of Guimet's factory speedily rose from twenty thousand to one hundred and twenty thousand pounds, of which twenty thousand pounds were exported to foreign countries. Not only did Guimet amass immense wealth; he was the recipient also of many public honors. From the French "Society for the Encouragement of Industry" he received a premium of 5,000 francs, and medals from various French industrial exhibitions; and this as early as 1834, when the real importance of this eminent discovery could have been scarcely appreciated. In 1851, at the London exhibition, Guimet received the large gold medal.

In Germany the manufacture of ultramarine proceeded at a far slower and less profitable rate, though the directions published by Gmelin would have amply sufficed for manufacturing on a much larger scale. He already knew that the proportions of silicious earth, natron, and potter's clay might vary to a certain extent without at all affecting the result; and he had also found that the production of artificial ultramarine requires two distinct operations, viz:

1. The production of the so-called green ultramarine; and,
2. The transmutation of the green into the blue article by roasting the former, while allowing the access of air.

This latter necessity he was taught by the accidental bursting of a crucible. His observation of this accident enabled him to master the whole process, and conduct it to any desirable issue. To the manufacture on an extensive scale, however, the condition insisted upon by Gmelin of perfect or chemical purity in the silicious earth and the potter's clay employed, continued to present an embarrassing obstacle on account of the delay and difficulty in bringing the material to that state.

It is true that he had himself raised the question whether the production of the two expensive materials, both of them being components of potter's clay, might not be dispensed with, and he experimented upon various specimens of tolerably pure clay containing the maximum of 4⅓ per cent. of iron. But he considered the results of the experiments unsatisfactory, on account of the presence of even such a proportion of iron. From a porcelain clay containing very little iron he obtained, indeed, a very beautiful ultramarine, which he considered quite fit for oil painting, especially for landscapes. But even this product could by no means be compared to the natural and most beautiful kind. The artificial article always retained a scarcely perceptible tinge of green and gray; while the positive red, on which depends the peculiar brilliancy of the natural ultramarine, was wanting. This difference was especially noticeable when both pigments were rubbed in oil. The circumstance that Gmelin aspired to the highest excellence, and would not content himself with mere mediocrity, was an obstacle to the introduction of this article into German industry, and restricted its use when it was introduced. Still, the first German manufactory on the principle of Gmelin's process commenced working in 1834, under the management of Leverkus, of Wermelskirchen, and very soon occasioned a great change alike in the price and the popularity of the article.

In 1832, the celebrated French chemist, Dumas, in his "Manual of Chemistry," had expressed the opinion that chemical purity of materials might very well be dispensed with in the manufacture of artificial ultramarine, and that common clay might be used, provided it did not contain too much iron. Professor Engelhardt, of the Polytechnic School, Nuremberg, while translating the works of Dumas into German, was especially impressed by that statement, and was induced thereby to make new experiments, but his labors were terminated by death before he had obtained any positive and satisfactory results. His assistant and successor, Leykauf, continued the deceased professor's experiments, and was fortunate enough to succeed, where all previously had failed. By means of potter's clay, Glauber's salt, and coal, he manufactured the most beautiful ultramarine, in the renowned manufactuory of Ley Rauf, Heyne & Co., at Nuremberg; and in a very few years the firm counted its wealth by millions. Nowhere else has this branch of industry acquired such an extension; being conspicuous even among the diversified activities of Nuremberg, and justifying, therefore, a brief description in this article.

In the vicinity of the Nuremberg railroad depot, the attention of the observant traveller is pretty sure to be attracted by a stately and spacious mass of buildings of white and red sandstone. The long rows of structures, with their streets and yards, cover a space of some eighteen acres. Surrounded as the whole is by a rampart, one might at first fancy himself to be looking upon a fortress. But the smoke from numerous tall chimneys would speedily correct this error and betray the abode of ingenious and successful industry. It is to be regretted that visitors are rigidly excluded from the interior of this industrial hive; a useless exclusion, as the manufacture of ultramarine can no longer by any possibility be considered a secret. The visit of the King of Bavaria, in 1855, to this equally interesting and important factory, so far lifted the veil that we possess something like a reliable description, instead of the strange surmises which were previously in circulation with respect to it. On a first glance at the exterior we perceive that the vast erection has been built piecemeal, additions having been made from time to time to meet the necessities of the increasing business. It required the long period of seventeen years to render the whole what it now is—a structure heterogeneous, indeed, in appearance, but really possessing the highest conceivable adaptation to the purposes for which it was designed.

Three rows of the buildings are devoted solely to the preparation of the raw material, the motive power consisting of two steam engines conjointly possessing a thirty-eight horse-power. So various and well contrived are the stampers, crushing and sifting machines, &c., which are set in motion by these various works, that a small amount only of human labor is required to furnish abundant raw material to employ elsewhere a vast number of hands.

Groups of buildings surrounding those just mentioned contain water-works, and consist of five divisions of vaulted galleries, supported by iron pillars. Near these are the drying stoves. Close by these three principal divisions are the buildings for storing, packing, and weighing, and the clerks' offices and repairing shops. Here is a scene of continual activity, the human labor being greatly aided by a high-pressure steam engine of twenty-horse power. The communication between these various and extensive buildings is facilitated by a railroad six thousand feet, or considerably above an English mile, in length, crossing from east to west, and from north to south, and similar tram roads of timber connect the buildings in the upper stories. The iron railroad leads to the depot of the public railroad; thus placing the factory in easy and speedy communication with the principal high roads of Germany. The weight annually carried on this little railroad amounts to nearly 2,000 tons; about one-tenth of which consists of the manufactured article.

About 200 laborers are constantly employed in this establishment, and it is greatly to the credit of the proprietors, Zeltoner & Heyne, that they have established a savings bank, a sick fund, and a fund for the support of widows and orphans.

We have spoken of the remarkable fall in the price of ultramarine. Competition and improved machinery and modes of operating have effected so much in that respect, that the whole price of the best article at the present time does not exceed that paid for the mere grinding, only eighteen years ago. This continual fall of price necessarily compels a corresponding expansion of the manufacture and sale to compensate for the deficit in profit. On this account scarcely a year passes without the addition of new buildings to this vast establishment. Considerably more than 5,000 tons are manufactured here yearly, at the average cost of from 25 to 37 cents per pound. The cheapness and exceeding beauty of the color cause it to be profitably and largely exported to France, in spite of the absurdly heavy import duty levied upon it there.

What we have said of this single manufactory, vast as it is, gives but a very inadequate idea of the extent and importance of the ultramarine manufacture in Germany. At the Industrial Exhibition at Munich no fewer than seven extensive manufacturers received medals, and two were honorably mentioned.

At the Parisian exhibition the French manufacturers did not dispute the excellence of the German ultramarine, or the exquisite beauty of its colors. But

they complained that it was of so many different shades that the various trades and professions which use the article were unnecessarily embarassed in the choice among so many gradations of color; for while the German manufacturers exhibited twenty different tints, the French furnished but eight. To this Germans replied, that in supplying so many different shades of the color they but complied with the public wish. Yet, nothing can be plainer than that in everything relative to color and cognate matters of taste, it is not the public which prescribes, but the artist, who elicits the artificial want. It was Phidias who created the Athenian taste for the surpassing beauty of the Phidian sculpture.

Up to 1849, France had only two manufactories of ultramarine. In that year a third was added, in Alsace, (Zuber & Co., at Rixheim,) which deserves mention with that of Guimet, who still sustains his long-established reputation. To such an extent is the manufacture of paper-hangings carried on at Rixheim, that the manufacture of colors might appear a merely accessory and subordinate branch. But such is not the fact; for, besides supplying the home demand, that factory exports to a very large amount. As long ago as 1849, the establishment employed 500 laborers, at an expense of $43,333. And the motive power consisted of 44 machines, exerting, in the aggregate, a sixty.two horse power.

As mentioned above, Gmelin's mode of using only the very purest raw material has been abandoned. But, though the ultramarine manufactured on his method was undoubtedly more costly, it is no less certain that it was also far superior in color to all other sorts of ultramarine. Economical manufacture is now sought in a variety of ways. A white German clay found in many parts of the country, and known to the trade under the name of "lanzin," is the most commonly made use of. White porcelain earth is preferable on account of its greater purity. A small portion of magnesia and lime is of no consequence; but if iron be present in greater proportion than one per cent., the utmost care is requisite to produce an even tolerable color. All foreign matters of a tangible kind are carefully removed by repeated washings; the clay is then dried, made red-hot, and reduced to a fine powder in a mill or stamper. These preparatory processes, simple as they appear to be, are in reality of great importance, and the mechanical contrivances for rendering them perfectly effective are among the most ingenious, as well as the most costly, of all the machinery employed in the manufacture. To the ground or crushed mass there are now added sulphuric natron, soda, sulphur, and coal or charcoal; the whole having been previously reduced to the finest possible powder. If coal instead of charcoal be used, such must be selected as after combustion leaves the smallest quantity of ashes. Sometimes rosin is used instead of coal, and, being decomposed by the heat, answers all the purpose of the mineral. Heated together, these various materials become fused into one mass. Upon the process thus far described, and, especially upon the exactly proper proportion of each of the materials, the result greatly depends.

With regard to one point in the procedure there is a wide difference between the French and the German manufacture. In the latter, Glauber salt or a mixture of that salt and natron is always used; in the former, only soda. The German mode is the more economical, because the sulphuric acetical natron is by the agency of the coal converted into sulphuric natrium, and thus the sulphur can be wholly or partially dispensed with if soda be added at the same time. It is true that a somewhat greater quantity of coal will be required, but there can be no comparison between its price and that of sulphur. As to the result, it does not seem that the one or the other method is very greatly preferable.

There is great difference in the proportions of the several components of this mixture; but the following may serve as a general rule:

GERMAN METHODS.

	Parts.
I. White potter's clay, free from water	100
Glauber salt, free from water	85 to 100
Coal	17
II. White potter's clay, free from water	100
Glauber salt, free from water	41
Soda, free from water	41
Sulphur	13
Coal	17

FRENCH METHOD.

White potter's clay, free from water	100
Soda, free from water	100
Sulphur	60
Coal	11

The next operation to be performed is that of what is called the over-glowing of this mixture. It is placed in melting pots of potter's clay, formed to withstand intense heat, and slowly dried till burnt. Absolute exclusion of air being indispensable, it is especially requisite that the melting pots be so tempered that they will neither burst nor become softened in the intense heat requisite to burn the mass within them. They may vary from 4 to 12 inches in height, with the like diameter. When filled up they are packed one on the other in a furnace resembling in form a flattened brickkiln. They occupy the whole centre of the surface, while the space on each side of them is used for the burning of similar pots. The furnace being properly filled, the mouth is walled up, and the firing commences. The burning continues during from seven to eight hours up to three days, according to the size, construction, and contents of the furnace. Fuel must be added till the mass is thoroughly incorporated and begins to melt. Upon this operation everything depends. If it be not properly conducted, the best and most accurately proportioned raw material will not yield a profitable result. The temperature must be of a certain height, which is to be ascertained beforehand by trials in a small testing oven. It approaches a bright red or incipient white heat, and must be kept at the same point during a specified time; and it must be made to heat the whole mass as thoroughly as possible. When the furnace is cooled, the glowed mass is taken out and cooled with water, and then repeatedly washed and drained to remove any salt still remaining. The now dried and spongy mass is next removed to the mill and broken and pulverized to the utmost possible degree of fineness; the powder is repeatedly washed with water, and after being thoroughly dried, again ground and nicely sifted. It has now reached the first stage of ultramarine, or what is called green ultramarine, and is ready either for sale or for transmutation into the blue colored or proper ultramarine. Hitherto, however, the green ultramarine has been in no very great request, as compared with the blue. It varies through several shades, from apple green to blue green; and in beauty it is far excelled by the copper color and even by the cobalt. Its chief, if not its only recommendations are its cheapness and its innoxiousness; and those qualities, important as they undoubtedly are, seem insufficient to counterbalance its want of brilliancy.

The next important operation is the transmutation of the green into the blue color. Here there is but one cause for anxiety. To obtain a perfectly beautiful blue, we must previously have a perfectly beautiful green. The latter is roasted with sulphur, air being freely admitted during the process. It sometimes happens that the change of color takes place without any interference. The sulphuric natrium contained in the mass causes spontaneous ignition on the admis-

sion of air, and when it ceases to glow we have still sulphuric acid present, and the green color is thus self-changed into a beautiful blue.

As to this process also of transmuting the green color into blue the French and Germans have their peculiar methods. The Germans use small iron cylinders for roasting; the French small hearth ovens, into which, however, the flame cannot enter. Hitherto cylinders of potter's clay have not been adopted, though we doubt not that they would serve just as well, and be even more durable. The cylinder being filled with from twenty-five to thirty pounds of green ultramarine, a vane (Flügelwelle) is set in motion so that the contents of the cylinder may not be burnt without being first thoroughly roasted within. A pound of sulphur is now passed through an upper opening into the cylinder, and while the wind-vane continues in motion the sulphur is gradually consumed. The addition of sulphur may be continued as long as the color improves in purity and brilliancy, but care must be taken not to continue it too long. After the color has been thus roasted it must once more be washed, dried, ground, and sifted.

The French method of roasting possesses this advantage, that, by allowing a freer accession of air, the green mass is the more speedily transmuted into blue. But, on either the French or German method, a large quantity of sulphuric acid escapes, which renders the factory a nuisance to its neighbors, while, were that quantity of sulphuric acid preserved, it would suffice for the production of all the Glauber salt used in the manufacture.

The quality of the green color is the rule and test of that of the blue; but something of its intensity also depends upon the manner in which it is ground—the finer it is powdered the brighter and clearer it becomes. But not all kinds are of equal beauty; lighter tones of color are frequently obtained without there having been any appreciable difference in the mixture of the raw materials. From these lighter and darker shades a medium kind is obtained by mixing them together, and adding other white or light materials. Where this admixture is resorted to, equal tones of color are out of the question; the shades vary from the softest sky blue to a glowing, almost ruddy, dark blue—the former generally forming a more compact powder, the latter a more loose and smooth one.

The principle upon which the blue color of the ultramarine is dependent is as undecided now as it was in the time of Gmelin. It is much to be regretted that his analysis of the Lapis lazuli, which so much conduced towards the manufacture of artificial blue ultramarine, has not been repeated and followed up. The foundation which he laid in scientific experiment has been built upon only in the way of the merest empiricism; and the success which has thus, in a merely monetary point of view, been obtained by the manufactures, has led not a few of them to imagine—how vainly we need not say—that henceforth they are quite independent of science. They forget that practical men, however ably they may profit by what science has taught them, do literally nothing towards clearing up what science itself has yet to learn. It was the science of Gmelin which alone laid the foundation for the manufacture of ultramarine as it at present exists; but who shall pretend to limit the improvements that might be made in that manufacture could another Gmelin arise to discover the principle on which the coloring of the ultramarine depends? Attempts have, indeed, often been made to lift the veil from this mystery, but hitherto they have been so made that it was impossible for them to succeed. Analysis has followed analysis, regardless of the fact that the ultramarine trade is not a preparation of determinate composition from which uniform results can be obtained. However accurately the operator may have treated the clay with water and sulphur, does not the color imbibe some portion of silicious matter? Nay, has not each specimen of clay different elements and different proportions of elements in its own composition? How are we to tell, even

from the most skilful and laborious analysis, which is the essential product and which the accidental? Which the portion which conduces to the production of the color, and which the portion that, to a greater or less extent, limits its quantity and diminishes its brilliancy? The time spent in analyses, thus inevitably indecisive, may be considered as completely thrown away. In truth, those analyses have rather raised questions than settled them. The influence of iron, for instance, upon the production and the color, which long ago was considered a settled fact, is now relegated into the realm of doubt. There seems good reason to believe that sulphur has a chief, if not the sole, part in coloring the green and blue ultramarine; but how—through what combinations? The material itself opposes difficulties to our clear view of the subject; and the difficulties are increased by the coincidence of two chemical processes, and by the facile decomposition of the material the moment it is attacked by reagents. Finally, we are but too imperfectly acquainted with the affinities of sulphur and the recently discovered sulphuric acids for the alkalies. This powerlessness of analysis to pronounce definite judgment has necessarily given rise to various opinions, founded not upon facts, but upon fancies, and, as usual in such cases, the opinion founded upon fancy has been more peremptorily asserted than the knowledge founded upon fact. Of the green ultramarine, we have seen it positively asserted, though without even an attempt at proof, that it is a simple combination of sulphur natrium, while another disputant is not less positive that it is a mixture of blue ultramarine with some yellow substance, the elimination of which turns the green to blue. Others assert that the acid has transformed the sulphur natrium of the green ultramarine into a sulphuric metal, combined with other and unascertained matter; that oxydization has taken place, and the sulphur has united with the undecomposed sulphuric natrium. According to others the oxygen acts upon the sulphur and forms a sub-sulphuric acid, or some other of the recently discovered sulphuric acids. In short there has been much disputation, but no approach to a conclusion which can be relied upon. To arrive at such a conclusion we must, as our starting point, first study the affinities of aluminum and sulphuric natrium.

All that we are thus far warranted in saying is simply this, that ultramarine contains silicious earth, potter's clay, natron, and sulphur. But, what else? *That* is the real question at issue. The silicious earth is, if not superfluous, at least inoperative, as regards the production of the blue color; but, though not itself the cause of the blue color, it at least supplies the fire-proof quality. Too much of it, undoubtedly, is injurious to the color. If the silicious acid be not fixed by natron, the blue color is either very much faded, or wholly destroyed, and the ultramarine is rendered unfit for the purposes of the porcelain painter. The artificial ultramarine has still another great advantage over the natural. While the latter could only be used for oil paintings, the former can be used in every art in which the blue color is indispensable, and consequently it has, to a very considerable extent, supplanted cobalt, litmus, and Prussian blue. Even when the ultramarine commanded a far higher price than smalt, (the latter selling, in France, at 47 to 50 cents per pound, while the former could not be purchased for less than from $1 62 to $1 73,) it was found that ultramarine was the cheaper article, for the simple reason that one pound of ultramarine would do the work of ten pounds of cobalt blue.

Ultramarine is a reliable color for oil painting or for painting on glass, for tapestry, and for paper-hangings in patterns, and for the coloring of soaps, candles, &c., &c., and it is not easy to over-estimate its importance in printing on wool, cotton, linen, or silk. To the French manufacturer, Blondin, belongs the credit of having been the first to use ultramarine in cotton printing. For six years he kept his application a secret; but, in 1844, Dolfus, a cotton manufacturer from Alsace, visited the French exhibition and made himself master of the process. Since then, as is said in the report of the French exhibition of

1849, "Guimet's method has travelled round the world, supplanting all the blue colors which had been previously employed by the cotton-printer." It must be confessed, however, that this statement is not quite exact, for the manufacturers still experienced some difficulty in using ultramarine. At first the color was, for the most part, not sufficiently fine, and consequently it affected both the spreading-knife and the rollers. That difficulty was obviated by the use of albumen, (the whites of eggs,) which thus became a by no means unimportant article of trade. It is used to condense, and to aid in spreading, the color, but requires some slight admixture of oil to prevent the decomposition which the albumen, pure and simple, was found to produce.

Ultramarine is used not only to produce a blue, but also a white. Every housewife well knows that blue of some kind must be used to counteract that yellowish tinge which linen and cotton goods acquire when washed. This use of the blue color is familiarly called *using the blue-bag*, but using the whitening bag would, in truth, be the more appropriate phrase. As a general thing the blue-bag is used far too freely. The effect should not be, as it generally is, to leave a blue tinge, but only to neutralize that yellow tinge with which we unavoidably associate the idea of imperfect cleansing. Ultramarine is also of important service in restoring linen and cotton yarns and fabrics to good color—from two to three pounds of the color sufficing to restore fifty pieces of linen. From ten to fifteen ounces are sufficient for the perfect bleaching of twenty pounds of yarn, and so effective is it in small quantities, and therefore so cheap, that even whitewashers use it to give increased brightness and cleanness to their white.

It was formerly considered, on toxicological grounds, that the use of ultramarine in whitening sugar was objectionable. We need here only so far advert to the discussions of the public journals upon that point as to say that two pounds and a half of ultramarine suffice to bleach fifty tons of sugar, being just $\frac{1}{50}$ grain to the pound, a proportion in which even that deadly corrosive, arsenic, would be entirely innocuous. Whether the sulphuric-hydrogen gas, which is liberated by the contact of the ultramarine in the sugar with the acid in wine, be offensive, is a question which we leave to the olfactories of the chemist to decide. How far ultramarine is, or may be, adulterated, chemists, we believe, have not, as yet, determined. Manufacturers maintain that it is not merely right, but even necessary, to mix potter's clay and gypsum with ultramarine, in order to get a lighter color; and to us it seems that, on that point at least, the manufacturer is a better judge than the chemist. The purchaser well knows that such admixture is made, and for what purpose, so that, whether right or wrong, there is, at all events, no deception; but if he wishes no such admixture in the ultramarine which he purchases, a simple and facile test of the quality is at hand. Adulteration is present if the color be not entirely discharged by strong acids, or if it change color when boiled in a ley of potash. The adulteration in this latter case has been made by organic matters, for the purpose of producing the fiery brilliancy of the natural ultramarine. If, to be thus tested, the ley assume a greenish tinge, the ultramarine contains a superfluous amount of sulphur natrium; and if the ultramarine adheres in hard clots or lumps the salts have not been sufficiently washed from it. When mere appearance is alone relied on as a criterion, the judgment, however practiced, is liable to be mistaken, for there is no other color which affords so much scope for visual deception.

There are two qualities to be regarded in the genuine ultramarine—the coloring and the covering quality—which maintain no direct ratio one to the other.

The coloring quality may be tested by mixing one part of ultramarine with ten parts of any white color—white lead, for instance, or clay, or gypsum—and then closely observing the tone of the mixture. These trials should never be omitted by purchasers, for in two ultramarines, which to the sight appear

exactly alike, there may be a difference, in both brilliancy and durability, of from one to two hundred per cent. Another important question is this: How much mordant does the particular ultramarine require? Nor is this important only in those great factories where the mordants are a considerable item of expense, for the artist also should be aware that every addition of mordant diminishes the clearness of the color. The less mordant the finer color, and *vice versa*.

It admits of no doubt that from remote antiquity the art of coloring of the raiment with which man invested himself had acquired a certain degree of proficiency. Pliny, though he gives no particulars of the processes, yet assures as that the ancients were well acquainted with the use of mordants, by which fixity is given to colors which otherwise would gradually change by successive gradations, or disappear altogether from the dyed fabric. Of those mordants he mentions human urine, ammonia, and certain salts, including rock-salt and soda, as serving to give at once brilliancy and fixity of color to spun and woven stuffs. And in another passage he intimates a still more advanced knowledge of the art of dyeing as practiced by the ancients. "In Egypt," he says, "cloths are dyed in a quite peculiar manner. The cloth is first thoroughly cleansed and then successively dipped into one or more solutions, and finally into the fluid color for which the previously used solution has so great an affinity that the cloth is dyed as permanently as instantaneously. What is most remarkable about this process is the fact, that though the dye-vat contains dye of only one color, the web of cloth is dyed of one, two, or several colors, according to the kind of solutions used for the preliminary washings or dippings. And further, not only is the cloth so permanently dyed that the color cannot be washed out, but the cloth itself is rendered stronger and more durable."

This language of Pliny shows, that our knowledge of the uses and effects of various mordants to heighten and fix color, and rather to improve than to injure the fabric of the stuff to be dyed, though doubtless much indebted to modern chemistry, is, substantially, as old as chemistry itself. In the case of ancient Egypt, such a knowledge need scarcely excite our surprise, that antique and mysterious land having been the source of the chemical science of at least all the people of antiquity. As nature herself suggested colored ornamentation, and the fugitive qualities of the earlier dyestuffs forced chemistry into the discovery of mordants, so the lack of a cultivated taste made the glaring scarlet and tawdry yellow the favorites of the earlier ages; just as, in our day, the same lack or imperfection of taste is apt to recommend those vivid hues to the favor of the childish and the unrefined. Next to the Egyptians the people of ancient India evinced most skill in the art of coloring. Job speaks with great admiration of the brilliant colors of Indian cloths. There is at this day in the museum of the *Industrial Society* at Paris a large and valuable collection of Indian colored stuffs, together with the utensils by which they were prepared. These stuffs should be called painted rather than dyed; the absorbent and mordant fluids were first applied with a brush, and the desired colors then laid on; those portions which were to remain white were at the outset covered with wax, and the outlines of the pattern traced on the remainder. There is also at Paris a shawl, ten feet long and five feet wide, the handiwork of Indian princesses, and so elaborately as well as beautifully executed that it must have employed the skill and industry of more than one generation of the royal and dusky workwomen. But everything else in ancient dyeing was surpassed by the proverbially pre-eminent

TYRIAN PURPLE.

Inventions have their place in Mythology, and not improperly; for if chance plays no inconsiderable part in the inventions and discoveries of the present days, so, also, it did in the days of old. All have heard, or read, the story of the dog

which occasioned the discovery of the beautiful Tyrian purple. As Hercules (so runs the fable) walked one day on the sea-shore with the fair object of his love, her pet dog, playing around them, seized an open sea-snail, and dyed his mouth of so beautiful a color that the lady uttered a wish to have a dress of that self-same hue. Hercules, of course, succeeded in granting her desire. It is assumed that this discovery dates from the year 1500 B. C.

For nearly all that we know of purple dyeing we are indebted to Aristotle, Pliny, and Vitruvius. Pliny mentions two shell-fish that yield the "purple," the "buccinum," so called, on account of its resemblance to a trumpet, and the "purpura." The coloring substance was said to be contained in a transparent and branching vein at the back of the creature's neck, and while the animal was alive, the fluid had a mucous or creamy consistence. If the fish were small, they were pounded; but if large, containing so much as an ounce of the highly valued fluid, the vein was detached, its contents mixed with five or six times its weight of water, and to the mixture thus formed soda was added, in the proportion of twenty ounces to every hundred pounds. The whole was then put into lead or tin vessels and kept in a moderately warm place for five or six days, the scum being from time to time carefully removed. As soon as the fluid assumed the precise tone of color that was desired, the wool was dyed. The process was very simple. The wool, being thoroughly cleansed from grease and all other impurities, was plunged into the dye for some five or six hours, or even longer if the object was to double dye the material, (*dibaphes,*) in which case it was highly esteemed and proportionably high in price. Wool thus dyed commanded in the reign of the Emperor Augustus the enormous price of two hundred dollars per pound, nearly its weight in gold!

We learn from Vitruvius that various countries had their peculiar shades of purple. At the north, the shade approached to violet, while at the south it became the vivid red which we now term a bright scarlet. Pliny also distinguishes two different shades of purple—the tyrium or purpura, a dark crimson like that of coagulated blood; and the amethystinum, the light violet blue of the amethyst. Both authors agree in stating that an excellent purple was obtained from some plants; our own madder, it would seem, being among them. Madder (Rubia tinctorum) was undoubtedly known and cultivated in several ancient countries—Italy and Judea, for instance. Woad, too, (Isatis tinctosria,) was well known to the ancients, and served to give to the purple that fine violet tint which was so much prized.

The purple-yielding shell-fish were found on all the coasts of the Old World; and in Greece, Italy, Dalmatia, Istria, and Egypt, there were large dyeing houses. Of course they used up an immense number of these minute animals; but the supply was equal to the demand. For instance, Mount Testaceo, near Tarentum, consisted almost entirely of the shells of the Murex brandaris, which we believe to be the shells from which the Roman dyers extracted their coloring matter. According to Tacitus, the Germans had a purple dye which was especially in request for linen. But above all the purple dyes of the ancients, that of Tyre and Sidon was admired, and it was a very important item in the commerce of the merchant princes of Tyre. No color has ever been so long valued and so profusely lauded as the purple. In the days of Moses it was the distinctive color of the great and the wealthy; Homer makes Æneas offer a superb purple robe to Bellerophen; Dives, in the New Testament, is "clothed in purple and fine linen;" and it was in a robe of purple that the stern Roman Imperator triumphantly returned to the seven-hilled city, after vanquishing and subjugating some far barbarian foe. Pliny speaks of "the Tyrian purple" as being a color so representative of dignity and majesty that Roman lictors made way for it with their fasces and their followers. Not only was it the distinctive mark for both young and old of high rank or great wealth, but was still further honored by being the indispensable color of the robes of those who reverently sacrificed to the gods, to obtain their favor or to avert their wrath. Pliny is so much in love with the purple that he deems it no mere idle vanity, but a laudable and natural yearning in men eagerly to desire it.

To the great majority of Romans purple was forbidden for a long time by its enormous cost as compared with the moderate fortunes of most of the plebeians; but when wealth flowed into Rome and corrupted the Romans, purple was fast becoming the only wear, and the Cæsars, from Julius downwards, prohibited its use by private citizens under pain of death. The Byzantine emperors made it penal even to write with purple ink, the use of which they monopolized for their own imperial signatures; and the very art of dyeing in purple was confined as a privilege and a monoply to favored individuals. As a natural consequence, the art decayed, and at length was entirely lost towards the end of the twelfth century, though so recently as the preceding century the Greeks, Saracens, and Jews, had been renowned for their skill as dyers. During the twelfth century the purple was less various in its shades, and very much less in request. But though the fickle tyrant Fashion, for a time, discarded purple in favor of scarlet, procured from the Thermes, the traditionary reverence for the imperial purple was not extinct, for even to this day, throughout the Old World, "purple" is synonymous with imperial power and place.

Strangely enough, while purple-dyeing was a disused, if not a forgotten, art in many of the countries to which it had once procured so much profit, it still continued to be considerably practiced in Britain. With that island the ancient Phœnicians are known to have had considerable commerce, the Britons, as we learn from Herodotus, supplying the Phœnicians with tin, and it is probable that it was from the Phœnicians that the Britons learned the art of purple-dyeing. The practice of the art existed in England till the close of the fourteenth century; and so late even as 1684 an Irishman is said to have made a large fortune by the peculiar skill with which he gave the purple dye to fine linen and other articles of female apparel. He, like the ancients, obtained his dye from a shell-fish.

The Chinese are said to have had a dye resembling the purple; and in the New World, according to Don Antonio d'Ulloe, the people of the provinces of Guayaquil and Guatemala were, from the earliest times, possessed of a beautiful red color, which they obtained from certain sea-snails of a size not greater than a hazelnut. These, on account of their scarcity, were highly prized, and were used only for dyeing choice and costly matters, such as beads, fringes, braidings, &c. It was the popular belief that both the weight of the animal and the color of its juices varied with the hours of the day.

The purple dye had at length become so entirely forgotten that what the ancient writers had said of it was regarded as a fable, invented by the Phœnicians to conceal their knowledge of the cochineal insect. A shell-fish yielding such a fluid was no longer known. It was not until the seventeenth century that the first attempt was made to rediscover and to ultilize the long-forgotten secret of antiquity. Then, indeed, men were enabled once more to view the prodigy with their own eyes, for in the West Indies, in Peru, on the coasts of Italy, France, and England, there were found muscles whose vital juices, from being at first colorless, soon took, successively, the shades of yellow, green, blue, and finally a splendid purple. William Cole, of Bristol, in England, was the first who, in the seventeenth century, experimented for the revival of the lost art of dyeing in purple, and he used only the common muscle which is so abundant on the shores of England, and after long trial at length discovered the long-sought-for shell-fish in the *Purpura Lapillus.* "If," says he, "we carefully break the shell we find, near the head of this shell-fish, a white vein lying in a furrow, and within that vein is a white, creamy, and somewhat glutinous fluid, which is the much-desired dyestuff." His description precisely coincides with that of Aristotle and of Pliny.

In 1709 Jussien made similar researches on the French coast—researches which, in the following year, were continued by Reaumur, who delighted to make theory and speculation the obedient handmaidens of every day utility. Somewhat later the soft-shelled molluscs of the Mediterranean shores were carefully examined by Italian naturalists, and so well has their pains-taking example been followed up that we are now acquainted with a goodly number of molluscs that yield the purple dyestuff. For the most part they belong to the families of the *Murex* and the *Buccinum*, of Linnæus; and it is thought that the *Murex trunculus*, of Linnæus, (one of the most abounding of the Mediterranean sea-snails,) and the *Purpura* and *Purpura putula*, of Lamarck, are identical with Pliny's *Buccinum*. The *Purpura Lapillus* is quite common on the European shores, and is believed to have been the most important among the purple sea-snails of antiquity. Lesson thinks that the *Janthina fragilis* is the true buccinum of antiquity. It is a native of the Mediterranean. In stormy weather it is thrown upon the coast of the French department of Ande in such vast numbers as actually to cover the strand. Lesson attributes to Narbonne (the *Narbo Martins* of the ancients) great skill and celebrity in the art of purple dyeing in the times of ancient Rome. Other writers say that though the Gallish purple was very splendid, it yet was very evanescent. The janthina undoubtedly affords a bright and beautiful purple, and when taken out of the water yields the fluid to the average amount of about an ounce. But the fluid is furnished by a gland entirely different from that spoken of by the old writers, a fact which it is difficult to reconcile with the ancient statement. Moreover, the modern purple is very evanescent, while the ancient was valued no less for its durability than for its beauty. Thus, in Plutarch's Life of Alexander the Great, we read that the Greeks found in the treasury of Darius purple stuffs to the value of five thousand talents, and that, though some of them were nearly two centuries old, the color had not at all faded. Lesson says that the coloring fluid yielded by the janthina passes through the same changes of light and shade as the vegetable colors do. With alkalies, it becomes blue; with acids, red.

Some writers include *Aplysia depulans* and *Scalaria clathrus* among the purple sea-snails, but this is doubtful. It is true that the aplysia sometimes voluntarily, always when alarmed, does emit a beautiful purple fluid, and, in the latter case, in such quantities as to color the water for several yards around. Probably the purple fluid, in the case of the shell-fish, is analogous to the ink of the cuttlefish, the concealing and protecting provision of the otherwise defenceless creature. The fluid is colored at the moment of its ejection, but the tint is of slight duration. The fluid of the *Scalaria clathrus* is still more evanescent—time and exposure to light discharging it entirely. Of the *Planorbis corneus* Wallis says: "If you put salt, ginger, or pepper into its mouth it yields a purple fluid, but the color is so evanescent that we know of no mordant that can fix it."

At present we are acquainted with a great number of purple-yielding shell-fish, but we cannot identify any of them with the purple sea-snails of the ancients, the descriptions left us by the old writers being too general and vague.

In our own time Bancroft has industriously experimented with the dyeing fluid of purple sea-snails, and he asserts that they yield a fluid which surpasses everything else in animal nature, alike for the brilliancy and the permanency of its purple, and for the facility and simplicity of its use. Within the fish, or when separated from it, the fluid has a creamy appearance, or, as Reaumur phrases it, resembles a well-developed pus. The textures to which it is applied become first of a light, then of a darker green, next blue, and acquire finally a rich deep purple tint, inclining to crimson. According to Bancroft, the gradual prismatic changes of the colors are as beautiful as they are remarkable. Even the most powerful chemical agencies, whether mineral acids or the most corrosive alkali, can only subject this purple to one change—wash the fabric in

strong soapsuds and the purple becomes a magnificent and permanent crimson. Dyed with this singular fluid the fabric passes through all the prismatic changes of color of which we have spoken, in a very few minutes; and if exposed to heat as well as light, the changes are so rapidly effected that the eye can scarcely appreciate the passing of one hue into another; but if, on the contrary, light be completely excluded, the first pale, yellowish green will remain unchanged for years. Bancroft proved this with some linen thus dyed, and kept for nine years in the dark.

As to the causes of the changes of color they are not clearly understood. Berthollet thinks that the coloring matter absorbs oxygen. Bancroft attributes the effect to light. He justifies his opinion by reference to the coloring of prints, flowers, &c., which coloring is known to take place, not from warmth, but from light. It is by the mere exclusion of light that we bleach, for instance, endive and celery.

As far as we are at present informed, the chemical nature of this coloring matter is as little known as the *modus operandi* of its successive changes after being applied to a textile material. Highly as Bancroft and others have praised the purple, it has had its day of popular favor. For dyeing fine muslins, and as a marking fluid, purple is still occasionally used. Even as long ago as the thirteenth century, scarlet, from Kermes, instead of purple, was the adopted color of the Hungarian magnates. Our numerous dyestuffs, and our facile and economical dyeing processes, render us independent of the ancient purple.

With the revival of science and art from the decadence into which they had sunk, during what are not unjustly called the dark ages, dyeing, like other arts, started into new, vigorous life. Till the fifteenth century, and still later, Italy bore away the palm in the art of dyeing, for which Florence and Venice were especially renowned. The discovery of America gave a great impulse to the same art, dyestuffs being furnished which were entirely unknown to the Flora and the Fauna of the Old World. From the Italians the mastery in the art passed to the Flemings; and when the religious persecutions by Spain drove the Flemings into exile, these latter carried their art into France and England. It was a native of the Netherlands, Cornelius Drebbel, by whom, in 1650, the discovery was made that cochineal was capable of yielding a dye far surpassing in beauty the purple of the ancients. Drebbel was at work in his laboratory, when an accident having thrown some *aqua regia* over the tin fastenings of the window panes, and thence into a bottle full of an aqueous infusion of cochineal, the latter on the instant assumed that magnificent scarlet tint which is now so well known. Drebbel was too acute and too reflecting an observer to neglect such an indication, and from that time cochineal has played an important part in the art of dyeing.

Modern chemistry, however, has done more for this art in single years than had previously been accomplished in centuries. Pure and effective mordants and mineral colors have wonderfully changed both the laborious and the economical processes of the art. Colored garments were formerly the external sign of rank or opulence. At the present day, thanks to the labors of men of science, the man who wears the homeliest and cheapest garb, as to quality of fabric, may yet wear it of the most tasteful color. Chemistry, however, is still making and will long continue to make still further improvements in this art, as in others. One of the latest acquisitions thus made by the secluded men of the laboratory is that of the much-valued coloring material known as

MUREXINE, (MUREXIDROTH.)

This color is extracted from the uretric acid contained in urine.

The ancient adepts, or alchemists, carefully analysed that fluid, in which indeed they sought their arcanum, and in the course of their experimenting they

produced volatile alkali, and phosphoretic ammoniæ natron. The last named salt was probably known to the ancients, and used by them in soldering metals.

The uric acid which now is so importantly utilized in urine, or rather in uric calculi, was found by Scheele, in the year 1776, which are, for the most part, composed of that acid, itself a component part of the urine of all carnivorous animals, and perhaps of all animals having a renal secretion;* being in the excrement of birds, snakes, and even in that of caterpillars, snails, &c.

Scheele remarked, that a solution of uric acid in acid of saltpetre left, when evaporated, a red sediment, and would stain the skin a fine red color. In 1818, Prout, by the action of ammoniæ on a solution of uretric matter in acid of saltpetre, discovered a material which he called "purple acetic ammoniæum," on account of its splendid color. He thus describes the process of producing it: Pure acetic acid and acid of saltpetre are mixed with an equal volume of water and gently warmed till solution takes place and strong fermentation is produced. The superfluous acid of saltpetre is then diluted with ammoniæum and the whole reduced by evaporation. During the operation the color gradually changes from purple to red, and through numerous shades of dark red. Greenish granular crystals are precipitated, which consist of purpuric acid and ammoniæum. This reaction is remarkable, and so positive that chemists have long availed themselves of it to detect the presence of uretric acid in any organic substance, for this characteristic coloring only takes place in the way mentioned and where uretric acid is present.

Liebig and Woehler, in 1837, also produced this brilliant colored matter while experimenting on the changes of uretric acid under the influence of oxydating matter. It appeared in the form of small crystals, or short four-sided prisms, which when held up to the sunlight appear of a rich garnet-red color, changing, under a reflected light, to a greenish metallic splendor not unlike that of the wing of a rose-chaffer. Those chemists believing Prout to be mistaken as to the chemical composition of this beautiful colored material gave it the name of "murexid," from *murex*, the purple snail. It is not formed directly from the uretric acid, which is first converted into aloxan and aloxantine by means of acetic saltpetre. These are two colorless combinations of little durability, but, acted upon by ammoniæum, they exhibit the purple-red coloring.

Prout produced several compositions from purpuric acid and other bases, such as lime, quicksilver, and oxyde of zinc, and all such compositions were remarkably beautiful in color. He also claimed that some of those compositions can be utilized not only in painting, but also in the dyeing of wool and other textiles, but his statement could not immediately be acted upon. In the first place, his description was so vague and general that experiments often failed when based upon it. Then the temperature, not less than the concentration of the fluid, is of great importance in producing the result, which often is very different even when the accurate prescription of Liebig and Woehler is followed. Moreover, in Prout's time the raw material was insufficient for the production of a large and constant supply of this dyestuff. It is true that, as we have stated, the uretric acid is furnished by many species of animals, but it is furnished only in very small quantities. Man, for instance, secretes only about one-third of a drachm of it in twenty-four hours. The excrement of birds is distinguished for its great proportion of uretric acid; it is $\frac{1}{72}$ part of the weight of dried pigeon's dung. But that could not be produced in large quantities any more than the excrement of snakes, which consists chiefly of uretric-acidical salts.

* Millions of dollars are annually paid for guano by the farmers on both sides of the Atlantic, yet they, for the most part, suffer the urine of their live stock to sink uselessly into the ground or to pollute and empoison the air, forgetting, if they ever knew, that guano is only more valuable than the manure of the farm-yard or the stable because birds have no urinary passage, and therefore their fæcal excrement contains all the uretric salts.—*Translator.*

If even the chemists were insufficiently supplied with the raw material, still less could it be procured for the purposes of industry. In Prout's time, the cost of a pound of uretric acid was from thirty-two dollars to forty-two dollars and forty cents; it can now be bought for from two dollars to two dollars and fourteen cents, though it is not in a chemically pure state. This great reduction, which enables the manufacturer and artisan to be plentifully supplied with murexid, is owing to the introduction of

GUANO.

This substance is imported from Peru into various parts of North America and Europe, at the rate of between one and two hundred thousand tons per annum. Guano is found in vast quantities in Peru and on many of the cliffs and islands in that part of America between the 13th and 21st degrees of south latitude. It is the excrement of sea-birds, and contains as much as four per cent. of uretric acid. In those regions the sandy soil could be but unprofitably cultivated without the aid of guano. It is known that as early as the twelfth century manuring with guano was practiced there. Under the Incas, guano was considered so valuable that killing the young birds on the guano islands was punishable by death.

Each of those islands had its superintendent, and each island was assigned to a particular province. From 6,000 to 7,000 tons were annually used in Peru alone; and when Alexander von Humboldt was exploring America, there were as many as fifty small coasting vessels employed exclusively in the transport of guano. Humboldt took some samples to Europe, where they were analyzed by Klaproth, Fourcray, and Vauquelin. The celebrated traveller and writer also published what he had learned as to the importance of guano to agriculture, but for some time his words remained unheeded. In Germany, Liebig's call upon the cultivators of the soil failed to stir them into activity, and it is even now insufficiently used, even by England, whose severely worked land more than almost any in Europe requires such a return of the elements of which years of grain-growing have deprived it.

Liebig and Woehler were the first chemists to experiment on guano. In the course of their inquiries on the subject of uretric acid they had often been embarrassed by want of material; they therefore requested William Kind, an apothecary of Bremen, to procure them some, and in due season received a hundred pounds weight from Valparaiso. So much have agriculturists been enlightened since that time, that, in several European countries, guano is an article of considerable yearly importation, and the raw material of uretric acid is never wanting. And such is the potency of modern chemistry that guano, so highly offensive to the nostrils in its raw state, is made to yield some of the most delicate of the perfumes which are used by the fair and the fashionable. A greater contrast than that presented in this case by the raw material and the article it is compelled to yield can scarcely be imagined.

The first attempts to render the murexid available for dyeing purposes were made by Sacc, in Alsace, that high school of the art of dyeing; and he succeeded in giving to wool an amaranth color far more beautiful than that obtained from cochineal. This induced Schunberger to try a new course of experiments, in which, if he did not entirely succeed, he at least ascertained that white textures could be thus dyed both handsomely and durably. Sacc maintained on this occasion that the coloring matter of the cochineal, the kermes, &c., has some connexion with murexid. He claimed to have discovered that birds, and especially those of brilliant plumage, the parrots, for instance, while they are moulting, secrete scarcely a distinguishable trace of uretric acid, but secrete a considerable quantity as soon as they recover their full plumage. What, then, becomes of the uretric acid when it is no longer excreted from the body?

May it not be metamorphosed into some other substance which, like the alloxan, is capable of dyeing the feathers? These questions are only suggested, and we are not as yet able to supply the answers; but this hypothesis, if adopted with regard to birds, must also be extended to reptiles, insects, &c.

The murexid is now a favorite dyeing material, strongly competing even with cochineal. Germany, as usual, was the last to adopt it. In a new and little known process mistakes are quite natural. When this new dyestuff first made its appearance as an article of trade, under the names of purple carmine, purple murexide, or paste murexide, it was in the form of a dirty-brown pulp. Though it sold as high as $4 80 to $6 the pound, it was a very inferior quality, and in many cases contained not more than from four to five per cent. of the murexid. Of course, this inferiority arose from imperfect preparation.

To extract uretric acid from guano, the latter must be moistened with diluted acid of salt, and warmed. The calcarcous salts and everything soluble in water or acids is removed, while the uretric acid, with a not inconsiderable quantity of sand and other adulterations, remains. The well-washed residue is then put, in small quantities, into acid of saltpetre of 1.45 specific gravity, and the vessel must be kept cold. Only when the fermentation subsides should more uretric acid be added. By this procedure alloxan and alloxantine are obtained. But it must not be forgotten, that, as it is impossible to hit upon the exactly correct quantity of the acid of saltpetre, we should always have a surplus of the acid at hand. It must be remembered, too, that very noxious fumes escape during the evaporation of the solution. The above-mentioned chemical products of uric acid suffer a further decomposition, and form combinations destitute of murexid. To avoid this, it is necessary that to the solution of uric acid and acid of saltpetre there should, during the evaporation, be an addition of ammonæum. Murexid may be formed without that addition, but always at the expense of the alloxan and alloxantine; for if the ammonæum be absent during the evaporation, the alloxan and alloxantine are required to supply its place in the chemical production of murexid during the evaporation; and, moreover, the decomposition just spoken of continues, and we run the risk of having the murexid destroyed as fast as formed.

The murexid must not be suffered to crystallize; the solution is to be evaporated only to the consistency of a pulp. In the whole process there should be the utmost care observed that only the purest and best murexid be produced. The high price of the pure article would be more than compensated by its greater efficacy in dyeing. All textile fabrics, silk, wool, cotton, and flax, may be dyed with murexid, which is also used in cotton printing. Truly splendid colors are obtained by using the oxmuriate of mercury as the adhesive medium. We are obliged, however, to confess with regret that the murexid red cannot compare with the ancient purple as to durability. Samples on which we experimented with the usual re-agents lost their colors, however beautiful. We do not speak of such re-agents as the corroding alkalies and potent mineral acids which would affect, and in our experiments did affect, black no less than murexid red. But this latter faded under the application of even weak vegetable acids, such as vinegar, lemon-juice, &c., and even perspiration left visible traces upon the delicate tincture. Here, no doubt, are considerable defects; but it is to be remembered that the whole art of dyeing with murexid is as yet in its infancy. Even the ancient purple was not indestructible, and in the present day the public demand is not for indestructibility, but for cheapness. If the color please the eye and the price per yard be low, little is thought about the durability of the article. Time and the progress of chemical science will doubtless remedy the defects spoken of, since there can be no question but that this color is susceptible of great improvement. If the murexid be precipitated from its solutions by metallic salts, as, for instance, oxymuriate of mercury, or salts of lead or zinc, very beautiful lac colors are obtained, which can be used for the painting or printing of paper-hangings; and quite a new field is opened to the dyer and printer of textile fabrics by the affinity of this coloring material for various metallic salts. Not only several beautiful shades of red can be produced with it, but also yellow, blue and violet.

And thus it is that our sober and utilitarian day steals one by one its glories from hoar antiquity. What the mightiest and haughtiest magnates of the olden day claimed as their exclusive privilege has now become common property to the humblest as well as to the highest. A striking proof, this common property in beautiful colors, of the superiority of the present age in its utilitarian tendencies to that antiquity which we so highly, and, in a purely asthetic point of view, so justly, glorify. The animals which supplied the ancients with their costly purple are perfectly known to us and easily obtainable, but we cast them aside, because we can more readily obtain our objects by other means. Whether the murexid be the very "purple" of the ancients is a question fairly open to discussion; but that it is so is by no means improbable. We know that uric acid is a constituent of the common snail, and, it is not unreasonable to suppose, of the purple snail also, though the fact be not experimentally proved. Putrefied urine, added to the fluid of snails, furnishes ammonia; so that the ingredients for the formation of murexid are certainly present.

Should the murexid red be still supposed inferior to that resplendent purple which the old writers so eloquently extol, let it not be forgotten that the skill of the dyer was of old limited almost to that one really splendid color, and that our modern wealth of gorgeous colors and delicate tints was then not dreamed of. Could we place our murexid, however, side by side with the true Roman purple, the former probably would not lose by the comparison. The glories of antiquity, like the prestige of our modern great men, might lose not a little of their illusion were we placed in closer contact with them.

A MAORIS CHIEF.

while the men are
tattooed all over the face and nose.

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EMMA, PRINCESS OF THE MAORIS.

The older native women are tattooed about the lips.

The young women for the most part, especially those who live near white settlements, do not tattoo their faces.

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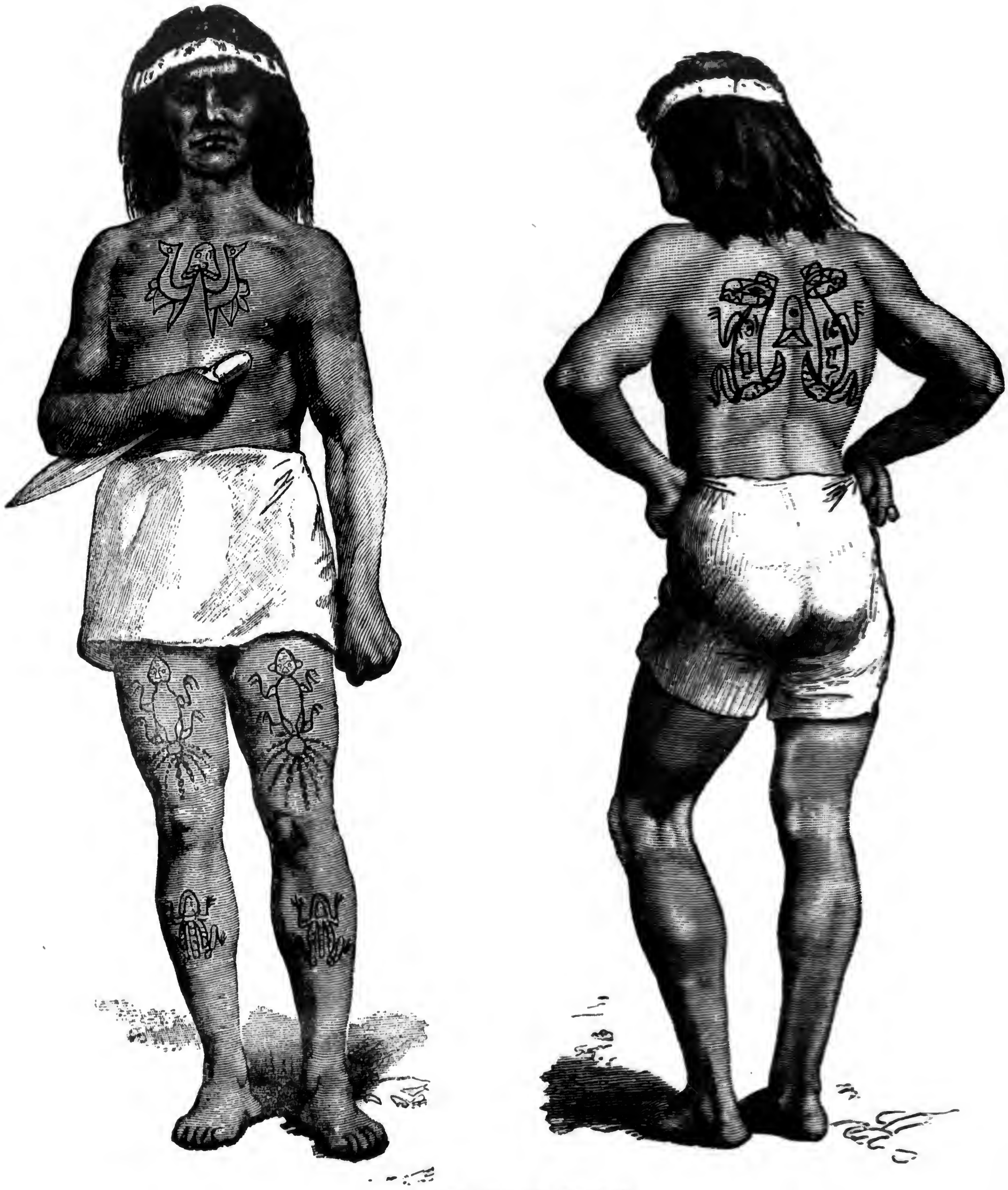
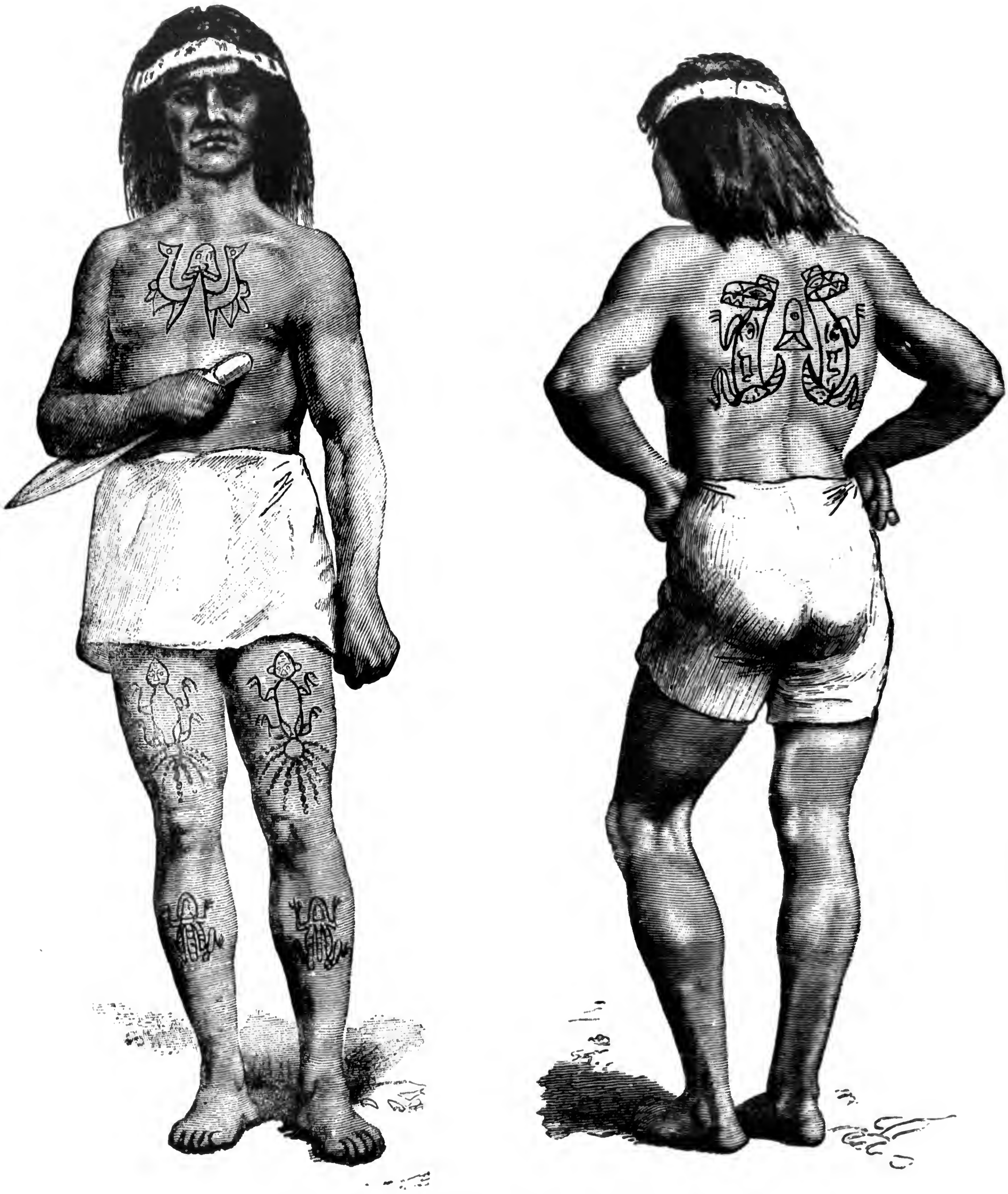


TATTOOING OF MAORIS.

PHYSICAL CHARACTERISTICS.

The full blooded Maori is, as a rule, well formed and is about five feet six inches in height, the body and arms being longer than those of the average Englishman, while the legs are shorter. The calves are largely developed, and as a carrier of burdens the Maori probably surpasses the white, while the white surpasses him in strength and general endurance.



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MILLIONS FOR COSMETICS.

What American Women Spend in a Year.

Jan 26 1890

Chicago Inter-Ocean.

Behind a little table, on which were arranged bottles, pots and boxes of washes, lotions, pastes, creams and powders, Dr. Albert E. Ebert, president of the Board of Pharmacy, talked to the members of the Women's Physiological Institute at Ethical Hall on "Cosmetics." He talked very plainly, too, fixing his points as he proceeded by exhibiting samples of most of the preparations popular with women. What he said was not so much in condemnation of the use of cosmetics as it was an explanation of the swindles practiced by manufacturers.

"There are 10,000 of these preparations," he said, "and one firm alone in the city lists 4000 of them." Then he read seven simple formulas and gave the names of a half-dozen elements, and said that every compound sold, under whatever name, contained nothing he had not named. "This little pot," he said, holding up a cream, "has at present a wonderful reputation on the strength of its secret formula. What is it? Common zinc oxide ground in equal parts of water and glycerine, and perfumed with rose. I will give you the formula," and he did so. "It has a pretty ribbon about it, and sells for $1 50, or $18 a dozen. What does it cost? Ten cents." Then he showed the ladies what they were buying when they purchased another "cream" of wide reputation. "You pay $1 50 for it. It is a pretty bottle and holds eight ounces. Seven of them are pure water. The other is calomel. Cost of Calomel for a dozen bottles, 33 cents; cost of bottles, 25 cents; filling and corking, 6 cents; total, 66 cents. Retail, $18."

"The danger arising from the use of cosmetics," said the doctor, "is greatly overdrawn. Face preparations have a legitimate use, and properly used are no more harmful than perfumes. Zinc, when present in powders, possesses some curative powers, and bismuth is only slightly injurious. The principal trouble is the continued application of powders and the stopping up of the capillaries of the face. Most face powders are only zinc, bismuth, magnesia, and chalk. Lead and mercury seldom enter into them. These are more frequently found in washes, which get their only merit from the glycerine or oil in which the elements are ground. In all of them there is no difference except as to name."

Dr. Ebert had some figures which showed that $62,000,000 was spent in America each year for cosmetics, of which $25,000,000 was reinvested in advertising, and that of the remainder $15,000,000 was profit.

PAINTED FACES.

They Were Seen in Cleopatra's Time and Are Seen Now.

New York Sun.

Are you a student of statistics? If you are not you will be interested in knowing that a German, who got accurate data concerning the amount of cosmetics used all through the world, says that the money that American women pay for them would paint 17,000 houses, allowing $75 for each house! Notwithstanding this horrible charge, I don't believe American women will quail when it comes to buying anything they think will add to their beauty. Of course, in nine cases out of ten it doesn't add to it, but even a man has to confess that a tiny little bit of powder, to take the shine off the nose, is desirable.

When Ovid was writing about women and their ways, he said that a fancy for looking ill and delicate and playing on the feelings of the men had taken possession of them, and that it was a smart thing to get a fetching pallor on their faces by white lead and other stuffs. In the ruins of Thebes an entire toilet case was found, with bottles of perfumery, jars of powder and tubes of paint, with brushes and cloths, evidently showing that the belle of that day not only knew how to take good care of her skin, but believed in having good tools to achieve good results. The belles of Nineveh were willing to suffer to be beautiful; they had their skins made smooth with pumice stone and then they were enameled.

Cleopatra not only had every cosmetic known in her day to add to her good looks, but she also wrote a book on the care of the skin, which is, unfortunately for the belles of to-day, out of print. In 1779 the English Parliament, which always looked for the protection of its men, considered a bill that read this way: "All women, without distinction as to age or rank, maidens as well as widows, who should deceive the male subjects of his Majesty and mislead them into marriage by means of paint, salve, beauty water, false teeth, false hair, Spanish wool, corsets or padded hips, should be punished under the provisions of the law against sorcery, and the marriage shall be declared null." The bill did not pass, I believe, and it probably emanated from the brain of somebody who had been deceived, and who wished, generously, to save his friends. In England to-day paint is much more generally used than in this country, where what is known as "saucer rouge," and which is applied with a soft linen rag, is in greater favor. English women make up abominably.

From the Princess of Wales to the chorus girl the idea of improving the face seems to be to put a dab of rouge under each eye, and not to shade it; to leave the ears and chin untouched, and to suppose that everybody believes this is real.

If rouge is used it should always be shaded off with a little powder, the lobes of the ears and the edge of the chin each being touched slightly with it, because any face on which there is a glow of color has the pink also at these points. Nobody blushes in a round spot. Shape the pink a little to your cheek, and if your face is very full make it longer than round. Don't put it on at all unless you think you can't go without it; that is to say, that you look so ghastly you feel that you need it. A color is sometimes given to the face by dabbling it in gin and water, the gin bringing the blood to the surface and giving it life; as in addition it softens the skin, there is no reason in the world why it shouldn't be used.

Tahiti. at Papaetee
A Traveller mentions
The following
About a Tattoed
Man

My new friend was originally a genuine London Cockney, though since he had left the sound of Bow-bells, his garment of nationality had become sadly tattered and mended, so that until you heard him speak, you were at a loss to know to what special department of the human family to assign him. One of his strange fancies was to bear away from each island where he resided, a portion of the tattooing peculiar to it. One side of his body displayed the coarse workmanship of the New Hebrides, while the other was the *chef d'œuvre* of Maletula, the most renowned tattooer in all the Marquesas. This great artist was so enchanted with the effect of his labors upon a white skin, that in pure love of art he was desirous of covering the whole body of Bill Sanders (for so my Cockney Mentor was called), even offering to waive the customary fee of tappa and whales' teeth. But Bill would not confine himself to any one school. He wished to be a walking gallery of every school of the art. So the great Marquesan was obliged to make up in delicacy of workmanship what he lacked in space. One leg was marked in the irregular squares and fancy stripes of the Samoans, while the other bore the clouded patterns which are the mode in the Kingsmills. Had he made his appearance in Broadway divested of his nether integuments he would have passed for a remarkably fine specimen of young America, with inexpressibles of the tightest fit, and of the most "stunning" pattern. In short, if any learned professor had wished to give lectures on the noble art of tattooing, he would not have needed to go beyond Bill for a specimen of every known style. His face only was left unmarked.

But notwithstanding his Polynesian exterior, Bill's tongue could never forget its pristine Cockney habits; and he murdered the king's English as ruthlessly in Tahiti as he had been wont to do in Saint Giles.

Apropos of my intended outfit . . .

Harpers Sep - 1853

A Missionary's Whitewash.

A missionary stationed at one of the South Sea Islands determined to give his residence a coat of whitewash. To obtain this, in the absence of lime, coral was reduced to powder by burning. The natives watched the process of burning with interest, believing that the coral was being cooked for them to eat. Next morning they beheld the missionary's cottage shining in the sun as white as snow. They danced, they sang, they screamed with joy. The whole island was in confusion. Whitewash became the rage. Happy was the coquette who could enhance her charms by a daub of the white brush. Contentions arose. One party urged their superior rank; another obtained possession of the brush and valiantly held it against all comers; a third tried to upset the tub to obtain some of the precious cosmetic.

To quiet the hubub more whitewash was made, and in a week not a hut, a domestic utensil, a war club or a garment but was as white as snow; not an inhabitant but had his skin painted in grotesque figures; not a pig that was not whitened; and mothers might be seen in every direction capering joyfully and yelling with delight in the contemplation of the superior beauty of their whitewashed babes.

Colors from wild plants.—A German writer shows that a great variety of colors and dyes can be readily obtained from common plants found almost everywhere, the method consisting principally in boiling them in water at a high temperature, so as to produce a strong decoction. Thus, for instance, the well-known huckleberry, or blueberry, (*Vaccinium*,) when boiled down, with an addition of a little alum and a solution of copperas, will develop an excellent blue color. The same treatment, with a solution of nut-galls, produces a clean dark-brown tint; while with alum, verdigris, and sal-ammoniac, various shades of purple and red can be obtained.

German writer.

Yellow can be obtained from the bark of the apple tree, the box, the ash, the buckthorn, the poplar, elm, &c., when boiled in water and treated with alum.

German writer

while the juice of the currant, pressed out and mixed with a solution of alum, will furnish a bright-red color. The bark treated in the same way produces a brown.

German writer

Primative Man, Ornamented

Barbaric Ornaments.

Savages are passionately fond of ornaments. In some of the very lowest races, indeed, the women are almost undecorated, but that is only because the men keep all the ornaments themselves. As a general rule we may say that Southerner's ornament themselves, Northerners their clothes. In fact, all savage races who leave much of their skin uncovered, delight in painting themselves in the most brilliant colors they can obtain. Black, white, red, and yellow, are the favorite, or rather, perhaps, the commonest colors. Although perfectly naked, the Australians of Botany Bay, were by no means without ornaments. They painted themselves with red ochre, white clay, and charcoal; the red was laid on in broad patches, the white generally in stripes, or on the face in spots, often with a circle round each eye; through the septum of the nose they wore a bone, as thick as a man's finger and five or six inches long. This was, of course, very awkward, as it prevented them from breathing freely through the nose, but they submitted cheerfully to the inconvenience for the sake of appearance.

They had also necklaces made of shells, neatly cut and strung together, earrings, bracelets of small cord, and strings of plaited human hair, which they wound round their waists. Some also had gorgets of large shells hanging from the neck across the breast. On all these things they placed a high value. The savage also wears necklaces and rings, bracelets and anklets, armlets and leglets—even, if I may say so, bodylets. Round their bodies, round their necks, round their arms and legs, their fingers, and even their toes, they wear ornaments of all kinds. From their number and weight these must sometimes be very inconvenient. Lichtenstein saw the wife of a Beltuau chief wearing no less than 72 brass rings. Nor are they particular as to the material; copper, brass, or iron, leather or ivory, stones, shells, glass, bits of wood, seeds, or teeth—nothing comes amiss. In South East Island, one of the Louisiade Archipelago, McGillivray even saw several bracelets made each of a lower human jaw, crossed by a collar-bone, and other travellers have seen brass curtain rings, the brass plates for keyholes; the lids of sardine cases, and other such incongruous objects, worn with much gravity and pride.

The Felatah ladies in Central Africa spend several hours in a day over their toilet. In fact they begin over night by carefully wrapping their fingers and toes in henna leaves, so that by morning they are a beautiful purple. The teeth are stained alternately blue, yellow, and purple, one here and there being left of its natural color as a contrast. About the eyes they are very particular. They pencil themselves with sulphuret of antimony. The hair is colored carefully with indigo. Studs and other jewelry are worn in great profusion. Not content with hanging things round their necks, arms, and ankles, and in fact wherever nature has enabled them to do so, savages also cut holes in themselves for the purpose. The Esquimaux, from Makenzie river westward, make two openings in their cheeks, one on each side, which they gradually enlarge, and in which they wear an ornament of stone resembling in form a large stud, and which may therefore be called a cheek stud. Throughout a great part of Western America and again in Africa, we also find the custom of wearing a piece of wood through the central part of the lower lip. A small hole is made in the lip during infancy, and it is then extended by degrees until it is sometimes as much as two inches long. Some races extend the lobe of the ear until it reaches the shoulder; others file the teeth in various manners. Dr. J. B. Davis has a Dyak skull in which the six front teeth have each been carefully pierced with a small hole, into which a pin with a spherical brass head had been driven. In this way, the upper lip being raised, the shining knob on each tooth would be displayed. Some of the African tribes also chip their teeth in various manners, each community having a fashion of its own.—*Sir John Lubbock's "Origin of Civilization."*

Fish Scales Powder for Paintings

The Chinese have a method of grinding up fish scales and using the powder as a dry pigment for employment in paintings.

Indelible Ink
Juice of the Whelk

Living Bottles of Ink.

Housewives of New England have growing abundantly on the seaside rocks in their neighborhood little living bottles of indelible ink, not to be excelled in beauty or durability by any manufactured product, since neither acid nor alcohol will affect this juice of the whelk.

San Francisco Chronicle

June 19, 1892

The Sources of Painters' Colors.

The following embodies some interesting information regarding the sources from which the colors one finds in a paint box are derived. Every quarter of the globe is ransacked for the material—animal, vegetable and mineral—employed in their manufacture:

From the cochineal insects are obtained the gorgeous carmine, as well as the crimson, scarlet, carmine and purple lakes.

Sepia is the inky fluid discharged by the cuttle fish to render the water opaque for its concealment when attacked.

Indian yellow is from the camel.

Ivory black and bone black are made out of ivory chips.

The exquisite Prussian blue is got by fusing horses' hoofs and other refuse animal matter with impure potassium carbonate. It was discovered by an accident.

In the vegetable kingdom are included the lakes, derived from roots, barks and gums.

Blue-black is from charcoal of the vine stalk.

Lampblack is soot from certain resinous substances.

From the madder plant, which grows in Hindostan, is manufactured Turkey red.

Gamboge comes from the yellow sap of a tree, which the natives of Siam catch in cocoanut shells.

Raw sienna is the natural earth from the neighborhood of Sienna, Italy.

Raw umber is an earth from Umbria, and is also burned.

To these vegetable pigments may probably be added India ink, which is said to be made from burnt camphor. The Chinese, who alone produce it, will not reveal the secret of its composition.

Mastic—the base of the varnish so called—is from the gum of the mastic tree, indigenous to the Grecian archipelago.

Bistree is the soot of wood ashes.

Of real ultramarine but little is found in the market. It is obtained from the precious lapis lazuli, and commands a fabulous price.

Chinese white is zinc, scarlet is iodine of mercury, and cinnabar, or native vermilion, is from quicksilver ore.—*Iowa State Register*.

Sepia

sepia is the dark fluid
from the ink bag of the
cuttle-fish

Saffron.

From Chambers' Journal.

Saffron would strike an ordinary observer as decidedly expensive at 56 shillings per pound, until told that it is composed of the central small portions only of the flowers of a species of crocus, 70,000 of which it takes to yield the material for one pound. The wonder then becomes that it is so cheap, that it can pay to grow and gather it at the price. As a matter of fact, it has failed to pay the English grower—by this retaining, in the name of his town of Saffron-Walden, but a hint of former importance in this particular direction—French and Spanish soils being more suitable to the full growth of the flowers, and foreign labor cheaper in the work of picking. Its use in medicine has practically died out, bar, perhaps, the popular belief that, steeped in hot milk or cider, it helps the eruption of measles to fully appear.

As a dye in creaming curtains and to give a rich appearance to cake it is still, however, in general demand; for which purpose it is well suited, in being both harmless and strong, one grain, composed of the style and stigmas of nine flowers, being sufficient to give a distinct yellow tint to ten gallons of water. Its high price, by the way, has led to a peculiar form of adulteration; for, apart from the crude and commonplace one of dusting with a heavy powder, such as gypsum, to give weight, the similar portions of other and commoner flowers have been specially dyed and worked thoroughly in among the genuine ones.

How Paints are obtained.

From the Argonaut.

Every quarter of the globe is ransacked for the materials—animal, vegetable and mineral—employed in the manufacture of the colors one finds in a paint box. From the cochineal insect are obtained the gorgeous carmines, as well as the crimson, scarlet and purple lakes. Sepia is the inky fluid discharged by the cuttle-fish, to render the water opaque for its concealment when attacked. Ivory black and bone black are made out of ivory chips. The exquisite Prussian blue is got by fusing horses' hoofs and other refuse animal matter with impure potassium carbonate. It was discovered by an accident. In the vegetable kingdom are included the lakes, derived from roots, barks and gums. Blue-black is from the charcoal of the vine stalk. Lampblack is soot from certain resinous substances. From the madder-plant, which grows in Hindostan, is manufactured Turkey red. Gamboge comes from the yellow sap of a tree, which the natives of Siam catch in cocoa-nut shells. Raw sienna is the natural earth from the neighborhood of Sienna, Italy. Raw umber is an earth from Umbria, and is also burned. To these vegetable pigments may probably be added Indian ink, which is said to be made from burnt camphor. The Chinese, who alone can produce it, will not reveal the secret of its composition. Mastic—the base of the varnish so-called—is from the gum of the mastic tree, indigenous to the Grecian archipelago. Bistre is the soot of wood ashes. Of real ultramarine but little is found in the market. It is obtained from the precious lapis lazuli and commands a fabulous price. Chinese white is zinc. Scarlet is iodide of mercury, and cinnabar, or native vermilion, is from quicksilver ore. Luckily for the health of small children, the water-colors in the cheap boxes usually bought for them have no relation, chemically, to the real pigments they are intended to counterfeit.

THE HISTORY OF TATTOOING AND ITS SIGNIFICANCE

With Some Account of other Forms of Corporal Marking. By W. D. HAMBLY, B.Sc. (Oxon), Oxford Diploma Anthropology, Anthropologist with Wellcome Expedition to the Sudan. Author of "Native Races of the British Empire," etc. Demy 8vo. Numerous Plates, Text Figures and a Map. 25/- net

No full treatise upon this important subject has been attempted since the issue of Joest's "Die Tatowirung" nearly forty years ago, which, of necessity, antedated the advent of modern anthropological enquiry. But research, during the last twenty years, reveals the existence of tabu, ceremonial and belief as a raison d'etre of body-marking in New Guinea, Borneo, Assam and N. America alone, whilst the connection of tattooing with such cognate subjects as migrations of megalithic culture, head-hunting and totemism represents entirely fresh ground for the student. All these problems are now fully dealt with in this the standard and only work on the subject in the English language.

Moko Tattoo, New Zealand.

ANCIENT WARRIORS OF THE NORTH PACIFIC

The Haidas, their Laws, Customs and Legends. By CHARLES HARRISON, F.R.A.I. Demy 8vo. Photographs and a Map. 15/- net

BANTU BELIEFS AND MAGIC (2nd Impression)

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Jan.-March 1929

tion rates in Drosophila. The sequences and articulations are particularly felicitous as brought out by the following selected chapter heads: "Development and Heredity," "Exchanges of Matter and Energy," "Transport in the Body" (under which are treated circulation, digestion, respiration, excretion, and the structures involved), "Organic Regulation," "The Internal Environment," "The Results of Evolution: The Animal Kingdom." As might have been predicted, the authors have made a contribution of distinct value to anyone aspiring to make an entry into the field of animal biology.

S. F. LIGHT

The History of Tattooing and Its Significance, with some account of other forms of corporal marking. W. D. HAMBLY. (New York: Macmillan Company, 1927.)

Mr. Hambly has devoted three hundred and fifty pages to a rambling discussion of two theoretical points: (1) that tattooing is magico-religious in origin; and (2) that the practice of puncture tattooing was diffused over the world at a fairly late date and probably from Egypt. The bulk of the discussion is devoted to the first hypothesis, illustrated uncritically with all varieties of proof. If tattooing be found at the present time associated with myths of its divine origin or inspiration, divine patrons of the craft, priestly practitioners, puberty rites, totemism, ideas of its value in the next world, marriage rites, birth rites, war ceremonials, fertility cults, use by shamans, taboos of any sort or rituals of any sort, then its magico-religious nature is said to be demonstrated in each special instance and for the practice as a whole. Mr. Hambly is so hospitable to any evidence from any area and supplements his illustrative material with such scanty knowledge of the cultural patterns of the cultures on which he draws, that the whole argument can be dismissed as worthless.

His second thesis, the late diffusion of tattooing from one center, probably Egypt, is supported by the too familiar map in which four large P's, applied at random, show the distribution of body painting on a continent, and a completely uncritical acceptance of some of the more fantastic attempts to establish a Polynesian chronology. The hypothesis which he advances is neither proved nor disproved by such comment. (The rough map is interesting, however, in revealing the very wide distribution of the practice of chin tattooing for women.)

The by-products of this compendious work are no more satisfactory. There is no discussion of variations in techniques, even within the kind of tattooing which he calls puncture tattooing. Such matters as the use of stamping devices, variations in pigments, the renewal of patterns which have been distorted by growth or dimmed by age, are hardly mentioned. There is no discussion of the localization of particular ideas associated with tattooing. In only two instances, tattoo marks as identification marks in the future life in India and Indonesia, and scarification marks as signs of membership in social groups in Africa, is the material arranged so that the reader can draw any conclusions. There is no adequate study of the distribution of designs or techniques. In the case of Polynesia, where Mr. Hambly does list the different islands, he neglects to mention the important historical point of the absence of tattooing among the Moriori and in Niue.

The bibliography is far from complete. Perhaps the most conspicuous lack is the absence of any reference to the two excellent monographs on Marquesan tattooing by Mrs. Handy (Bull. B. P. Bishop Mus., vol. 1, 1923) and Von den Steinen (Die Marquesaner und ihre Kunst, vol. 1, Berlin, 1925). Conspicuous by their absence are also the painstaking summaries of tattooing in different Polynesian islands by Ling Roth in the publications of the Royal Anthropological Institute (Journal, 4: 24; 35: 283; Man, 1906, no. 4; I.A.E., 13: 198).

The discussion of art ignores the problems inherent in body decoration and the degree to which tattooing has developed or kept a style which is distinct from the local art styles, and consists instead of a series of remarks about "geometric schools" and "naturalistic schools," the illustrations culled from widely separated areas. The main service of the book rests upon the assemblage of a large body of illustrative material about the number of diverse social and religious concepts which may become associated with such an old and widely distributed practice as tattooing and its relatives, body painting and scarification.

MARGARET MEAD

for use as correlated reading in any introductory course in ...
It is thoroughly up-to-date, including, in the chapter on "Physiology of Development," representative samples of recent significant experimental findings and, under Methods of Evolution, reference to the very recent and most significant use of X-radiations to increase muta-

Tattooing, Cicatricial Marking, and Body-painting. A contribution to comparative ethnology [*Tätowiren, Narbenzeichnen und Körperbemalen. Ein Beitrag zur verglichenden Ethnologie*] *by Wilhelm Joest, with 11 chromo-lithographs, 1 photo-gravure, and 30 zinc etchings from original drawings by O. Finsch, Cl. Joest, J. Kubary, and P. Preissler, with original communications by O. Finsch and J. Kubary. Berlin, 1887.*

This is a magnificent folio of 136 pages and 12 plates. It is printed in large, clear type (Roman), on heavy paper, with leaded lines and wide margins. The eminent ethnologist, Dr. Adolf Bastian, to whom the work is dedicated, need not feel ashamed of the outward appearance of the offering.

The subject being one which naturally demands colored plates for its illustration, the author has taken full advantage of the lithographer's art. Among the many beautiful figures presented, none are so artistic and wonderful as those of the Japanese, whose trunks and limbs, tattooed from neck to wrists and knees, seem covered with the richest silken fabrics. This elaborate tattooing is mostly confined to laboring men of the lowest class in Japan, who find it convenient in hot weather to work with as little clothing as can properly be worn.

On the whole, the work is a contribution of the highest value to the study of this subject. The author's opinion, however, that "tattooing has nothing to do with the religion of savages, but is only a sport or a means of adornment, which at most has connection with the attainment of maturity," is one which will not be generally concurred in by those who have studied this practice as it exists among our American aborigines.

W. M.

Am. Antiquarian, II. Jan. 1889.

A QUARTERLY BIBLIOGRAPHY
OF
ANTHROPOLOGIC LITERATURE.

COMPILED BY ROBERT FLETCHER, M. D.

NOTICE.

It is intended to continue this bibliography in each number of the AMERICAN ANTHROPOLOGIST, so that, as far as possible, it will present, by titles, the anthropologic literature from all sources which has appeared during the preceding three months.

As many foreign publications do not arrive in time, however, to be indexed for the quarter to which they would belong, it is to be understood that this bibliography includes everything that it was possible to index up to the time of closing for the press.

The abbreviations of titles of Journals and Transactions are such as are now in general use in scientific bibliography, and it is believed will be found to be readily intelligible. Should any explanation be desired, an enquiry addressed to the compiler will receive a prompt reply.

For convenience of reference a list is subjoined of—

SINGLE-LETTER ABBREVIATIONS.

a. aan, alla, auf, aus, aux, etc.
b. bei, bij, etc.
d. das, degli, del, der, die, din, etc.
E. East.
e. ein, eine, einer, etc.
f. fŏr, for, fra, für, etc.
g. gorli.
h. het.
J. Jornal, Journal.
k. kaiserlich, kŏniglich, koninklijke.
k. k. kaiserlich kŏniglich.
l. las, les, los, etc.
M. Medical, Medicine, Medico, etc.
m. mit.
N., n. Neue, new, nouveau, nuova, nya, North, etc.
n. F. neue Folge.
o. och. oder, over.
p. par, pei, pel, pour.
Q. Quarterly.
R. Raekke, Reeks.
r. reale.
S. Surgery, Surgical.
s. series; *e. g.*, 1. s., 2. s., etc; n. s., new series; sulla.
t. tegen, ter, till, tot, etc.
u. und.
ü. über.
v. van, vid, von, voor, vor, etc.
V. p. various places [of publication].
v. s. various sizes.
W. West.
z. zur.

(*) A star indicates a thesis.

Literary Digest, July 11, 1931.

Acme News Pictures

The Burmese Believe Tattoo Marks Make Them Immune to British Bullets

Tattoos vs. Machine-Guns in the Burmese Jungle

IN THE ELEPHANT GRASS and jungle ambushes of Burma the natives are tattooing themselves.

Tattooing means that the flames of rebellion are spreading. Burmese peasants who join the revolt against the Indian Government, explains the Manchester *Guardian*, believe that the tattooed insignia of a mythical bird, which they place on their arms, gives them immunity from British bullets and the punitive attacks of Indian troops.

Reports of this tattooing are puzzling and disquieting to the London press, which recalls the three long wars of the nineteenth century that were required to subjugate this picturesque country of Indo-China, and to incorporate Burma as a province of the vast Indian empire.

But the Burmese are not Indian, and, according to a well-informed correspondent of the Manchester *Guardian*, "there are not many Oriental races more antipodal than the Indians and the Burmese."

Now that India is seeking her freedom from the British Empire, Burma seeks emancipation from India. An ardent Burmese Nationalist explained to the *Guardian* writer:

"The Indians are fighting for their freedom, and we for ours; but it is not the same battle. We shall ask for no support from the Indian National Congress, and assuredly we have no intention of letting them run Burma if, and when, they get Swaraj."

THIS new Burmese revolt flared up last December, we read in the London papers; and neither the drenching rains of June nor the guns and airplanes of the Indian Government troops have succeeded in extinguishing it. In the London *News-Chronicle*, Robert Bernays explains that the government forces are not confronted with an organized enemy, "but the far more difficult task of defeating small, isolated bands of Dacoits." In Burma, these Dacoits are armed gangs which have maintained a guerrilla warfare ever since the defeat of King Thibaw by the British in 1885—gangs that never have been subjugated. Now they have renewed their violence, explains Mr. Bernays:

"The Burmese are masters of the art of ambush, and render effective pursuit very difficult in the thick jungle country, for they protect their camps with cunningly concealed spikes, one end of which is buried in the ground and the other pointed toward the enemy.

"These spikes are so sharpened that they can pierce boots and leggings, and inflict crippling wounds.

"The news as to the causes of the troubles confirms the impression that they are both nationalist and economic. It is an anti-foreign movement, directed not merely against the Indians and the British, but against the Chinese too.

"The Pongyis, who are a kind of order of Buddhist monks, are the chief instruments of revolutionary propaganda. Among a peasantry extraordinarily ignorant and superstitious, their thin, yellow robes are objects of great reverence in the villages, and their words have all the force of divine commands.

"Strange prophecies are whispered through the jungle villages that a king will once more return to Burma. There is actually a pretender, Sayasan, who has proclaimed himself King."

A RESIDENT of Burma sends to the Manchester *Guardian* further details of the terror spread throughout Burma by these blood-thirsty bands:

"The rebels have assumed a kind of uniform—often a colored sash—and are invariably tattooed with a mark representing a galon, or dragon.

"In the Burmese Army, before annexation, it was the custom for each unit or regiment to have its own distinctive tattoo mark.

"The rebels in the present case call themselves galons, or dragons, and they have appointed kings (now mostly scattered or captured), the chief of whom is Sayasan, now a fugitive.

"This 'King of Burma' has a grass-built palace in the depths of the jungle, lavishly furnished with clocks.

"The tattooing has a mystic significance, and insures the rebel from death by bullet or dahcuts. It will be seen that the whole movement has a medieval flavor.

"Nevertheless it is serious. It is not to be ignored because of its folly. The initial attacks on the government forces are not difficult to deal with, but the subsequent savaging of the population by dacoit bands is most distressing and tragic.

"A gang appears in the middle of the night and forces its way into some house or village, steals whatever poor property the people possess, murders or mutilates men, women, and children indiscriminately, wreaks vengeance on all who have resisted or who have furnished help or information to the Government, and then departs leaving the house or village in flames."

THE rebellion could be effectively stopt, this authority explains, by the immediate separation of Burma from India. This link, he claims, has been as irritating as it is unnatural:

"The question of the separation of Burma from India has been agitated for a very long time. The Simon Report advocated an 'immediate and public' declaration of separation—and there can be no doubt but that the scrapping of the Simon Report (Burma's political Bible) caused much anxiety.

"After the Round Table Conference, the British Parliament 'conceded the principle' of separation, but still nothing has been done.

"Meanwhile the delay has given time for organized hostility in India, which Burma strongly resents. It can not be said that the Burmese rebellion arises clearly out of the delay in granting separation, but the separation problem fills all the background, and the feeling between Burmans and Indians is strained.

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Retake of Preceding Frame

"The danger of the present rebellion is that it will spread.

"There are two ways of stopping it—one by drastic military action and the other by an immediate declaration of separation of Burma from India, which would rally the whole Burmese nation to the side of the Government. The Simon Report, the Burma Government, the Indian Government, the Round Table Conference, and the British Government have all pronounced in favor of separation, and it is difficult to see why there is any further delay in putting it into effect. At any rate, the consequences of delay are proving tragic for a lot of innocent and blameless people."

Acme Newspictures

British Troops Routing Rioters in the Tharrawady District in Burma

New Zealand's Way with the Workless

ENORMOUS DECREASES IN ITS NATIONAL and private income, resulting from the world slump in produce prices, have brought about unprecedented unemployment in New Zealand which keep the Government awake at nights worrying.

As a desperate remedy, writes a Wellington (N. Z.) correspondent of the London *Morning Post*, plans are under way to place the workless as small farmers on the land. To have an idea of just what the unemployment problem in New Zealand is, we are asked to note that in a total population of barely 1,500,000 there are nearly 40,000 registered unemployed men, besides women and girls, and not including many men who have not troubled to register. This Wellington correspondent goes on:

"The suggestion is that men should be put to clearing remaining crown lands as relief work, and then those who wish should have the opportunity of taking over small farmsteads.

"For this purpose such institutions as the lands department, the State advances office, and the public trustee are available to assist the settler financially. And it is not necessary for a promising man to finance himself. The land can be taken over at the government valuation, and a government mortgage secured on it up to 90 per cent. of the value of the land and the estimated value of improvements to be made on it.

"Advances may thus be obtained for the erection of buildings, for clearing, draining, fencing, cultivation, and other improvements, including grass seed, lime, manure, and implements, but not including live stock, which would have to be financed elsewhere, probably by a stock and station agency.

"The chief difficulty of such State settlement has been in the past that the original land valuation was too high to enable the settler, in many instances, to secure an adequate return to pay the interest on his borrowed money and to provide himself a living.

"Land values, however, are falling, and I understand that in the case of many of the remaining crown lands the Government is so anxious to further closer settlement that it will discuss any reasonable terms."

France, Open-Handed Money-Lender

FRANCE THE MISER, France refusing to aid in the reconstruction of Europe, France hoarding up gold and refusing to make loans to any European country except her "vassals" of the Little Entente—such is a malicious legend that has girdled the globe, and which Stéphane Lauzanne, in a leading article in the Paris *Matin*, now attempts to demolish.

To do this, Mr. Lauzanne presents the figures of France's foreign loans, because, asserts this distinguished authority, "nothing equals the eloquence of figures—it is sovereign."

Here is his list of the foreign loans undertaken by France to the divers countries of the Old World, translated into dollars:

1923	Belgium	6½%	.....	$16,000,000
1923	Austria	6½%	.....	6,800,000
1923	Bulgaria	6½%	.....	1,600,000
1924	Hungary	6½%	.....	3,840,000
1924	Germany	7%	(Dawes)..	15,000,000
1925	Hungary	6%	(consol.) .	2,400,000
1927	Poland	7%	(stab.)...	2,000,000
1928	Bulgaria	7½%	(stabil.)..	5,200,000
1929	Roumania	7%	(stabil.)..	22,400,000
1930	Germany	5½%	(Young) .	86,200,000
1930	Finland	5%	.....	12,000,000
1930	Poland	7%	.....	1,000,000
1931	Roumania	7½%	.....	23,000,000
1931	Jugo-Slavia	7%	.....	27,000,000
1931	Poland	6½%	.....	16,000,000

Just add these figures up, advises the editor of the *Matin*. They represent a total of $240,440,000—almost $200,000,000 since 1928, when the stabilization of the franc was effected. Of this amount no less than 3,026,000,000 francs ($121,040,000) went to countries which were the enemies of France in the Great War:

"So falls the double and lying legend that victorious France is not a lending nation, and that when she does make loans it is only to the countries of the Little Entente, her allies and her 'vassals,' in order to encourage them to arm themselves.

"Statistics, inexorable statistics, show that in reality, when France lends one franc to any country of the Little Entente, she lends one equally to the Central Powers, her enemies of 1914, to aid them to reconstitute their finances.

"God knows, however, that France would have plenty of reasons to refrain from generosity in the matter of foreign loans. If you attempt to make an estimate of all that France has lost, during the last half-century, by exporting her capital which is the fruit of her own economy, you would attain the moving and impressive total of one hundred billions of francs ($4,000,000,000).

"No country in the world having undergone such a drain, could continue to play the spendthrift."

"THE relative prosperity of France causes more envy than admiration," Pierre Etienne Flandin, Minister of Finance, is quoted as saying in the weekly report of the Banque de France, according to a United Press dispatch from Paris, which reports that the French Government is doubling its efforts to find an outlet for surplus French credits.

But France is not so admirable as a lender, think some English editors. For instance, the Manchester *Guardian* advises us that without "even a semblance of a dramatic gesture" the Bank of England has advanced Austria about $21,250,000.

It is now known, claims this Manchester daily, that Austria refused to accept the loan condition of the French authorities that the Austro-German customs union should be abandoned. Consequently, it is charged, France broke off negotiations for a loan for the Credit-Anstalt, the largest bank in Austria, and responsible for about 70 per cent. of Austria's industries.

Africa

Other indigenous people

C. Hart Merriam
Papers
BANC
80/18

Natural History - Feb. 1939

THE LONG-HEADED MANGBETUS—*Intimate glimpses of an African tribe notorious in the last century as remorseless cannibals, revealing a hospitable and intelligent people, skilled in architecture and given to extreme polygamy*

By MARTIN BIRNBAUM*

We had at last reached the ferry or "bac" of the Bima River, in the province of Stanleyville (Belgian Congo), and were rowed across by deep-chested, broad-shouldered, black pagayeurs, who sang with a savage, monotonous rhythm, while they toiled in their long canoes, carved from single tree trunks. The high-pitched voice of the leader, rang out as a solo, and was answered by his lusty chorus, "O Great River, give us strength —give us strength!" To keep them in time, one of their number beat a drum made of a hollow cylindrical block, closed at both ends and slit on one side.

As we approached the crowd on the opposite bank of the stream, I caught sight of a boy with a comparatively light, lustrous skin and a curious elongated skull, and I suddenly realized that we were in the land of the Mangbetus. In that moment, I recaptured the old boyish excitement which siezed me when I first read Schweinfurth's account of his discovery of the remorseless, long-headed cannibals who indulged in unholy mysteries and whose avaricious king, Munza, feasted daily on the flesh of a succulent child. Schweinfurth's attractive portrait of the cannibal ruler, looks superficially like a drawing on an ancient papyrus, and there are ethnologists who maintain that Egyptian influences can be traced among these people who deform their heads.

There are said to be about 50,000 of them in the Belgian Congo, their territory lying at about 3° N. latitude and 26° to 29° longitude, in the region drained by the Uele, Bomokandi and Ituri rivers. Although Schweinfurth's *Travels in Africa* appeared as recently as 1873, it soon became evident to us that the perils incident to his expedition were now virtually non-existent, and we felt that all the discomforts we had suffered, and the dangers, if any, which we might encounter in our efforts to escape the prosaic comforts of our firesides, would prove negligible, if we could add, however modestly, to our knowledge of these genial people, who received us smilingly and with genuine hospitality.

After an early breakfast at Isoro, to which we had been awakened by the chatter of hundreds of weaver birds nesting in the oil palms which were stripped and almost killed by them, we started from our rest house for our first real encounter with the Mangbetu tribes. It took the form of a visit, arranged by the Belgian Administrator, to the village of Matari. Tongolo, its chief, did not inherit his title, but it was conferred upon him by the Government as a reward for army services rendered, and he now settles quarrels and dissensions among the approximately 7000 natives of his district. Had his position been a hereditary one, the town would have been named after him.

He made a brave showing, when he came forward to greet us in his barbaric costume. Five leopard tails dangled loosely from his belt of raw okapi hide, each ending in a pompon of reddish orange feathers plucked from the grey parrot which abounds in the region. A similar tuft ornamented his leopard skin cap, which also boasted a bunch of long heron feathers and was held in place by the bone of a leop-

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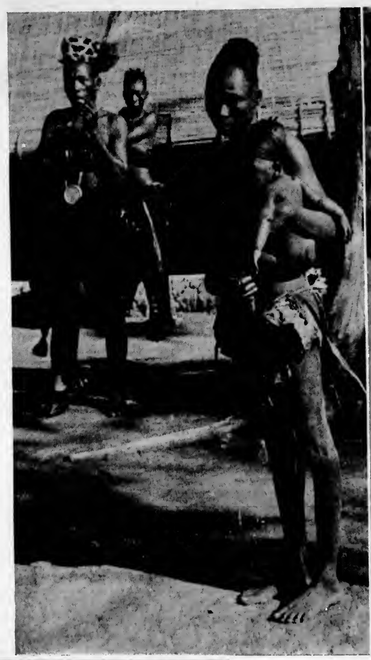
* MARTIN BIRNBAUM, a man of many parts, is celebrated chiefly in the world of art. Born in Hungary, he came to the United States at the age of five. He early developed a lively interest in natural history and "practically lived in the American Museum of Natural History," where he belonged to a number of allied scientific societies. He is also a talented musician. After receiving a Bachelor of Science degree from the College of the City of New York he took an M.S. from Columbia University and graduated from its Law School, as well as from its School of Political Science, to become a practicing lawyer. But after 1910, his interest in art became predominant and carried him to world-wide recognition as an authority. He was decorated by the King of Italy for his work as Commissioner of Fine Arts at the Biennale Expositions in Venice (1934 and 1936). His discriminating eye has proved its uncanny infallibility on many an old master, and has also spotted the talents of many new and unknown artists whose work he introduced through country-wide exhibitions. Working independently since 1916 he has traveled almost continuously, studying an amazing assortment of native arts, as well as natural history subjects. At one time he built up a private aquarium of between 3000 and 4000 tropical fish. Mr. Birnbaum is now on his way to some obscure islands of the South Pacific.

—THE EDITOR.

(Left) IN THE CENTER OF EQUATORIAL AFRICA, a reception committee greets the explorers in the name of Tongolo, Chief of Matari, a Belgian Congo village in the land of the Mangbetus. Supreme ruler over 7000 natives, Tongolo was the soul of hospitality and delighted in showing off his people to Mr. Birnbaum's party. The council house in the background is evidence of the architectural skill of the Mangbetus, considered the best native builders in Central Africa

(Below) SIXTY-FOUR WIVES AND 27 CHILDREN sometimes force Tongolo (resplendent in leopard skin turban) into the background, as when one of his wives poses with baby. Tongolo's title, conferred by the Belgian Congo Government for army services, is symbolized by his headgear, leopard tails on his okapi-hide belt, and his nondescript medals

(Below) "QUEEN" MOTHER: dignity characterized Tongolo's aged mother. Women generally occupy an excellent position; to them is left the cultivation of banana plantations and other food crops. The men are expert hunters and fishermen. Note Mother's handful of cigarettes, her reward for posing



(Left) CHIBBUKCHAK, Tongolo's man Friday. His duties include lighting his constantly smoking master's cigarette, holding his wholly superfluous ash-tray, and arranging the voluminous folds of his bark-cloth bloomers. The Mangbetus love tobacco but will smoke anything in a pinch

(Left) DANCE OF THE PYGMIES, with which the Matari Mangbetus entertained their guests. Terpsichore would seem to be one of their gods, for the Mangbetus are devoted to dancing and indulge in it on slight provocation, their bodies writhing in erotic gestures and their voices raised in monotonous chants. Accompaniment is provided by wooden drums and rattles woven from wood-fibre into gourd-like shapes, containing seeds or stones. These and their ivory horns and metal gongs, shaped like two lilies on a single curved stem, give evidence of delicate native artistry and craftsmanship

(Above) AN OLDER MEMBER of the nomad pygmy band which always comes to Matari to trade for food and other necessities. This 4½-foot man seems scarcely taller than Tongolo's grandson shown in the next picture.

The sturdy black babe, a favorite of his grandfather, was an exceptionally bright child and made friends with every white visitor. One of his cousins clings to his mother *(right)* who wears an elaborate *egbe*. Vaguely resembling a Gay Nineties bustle, the *egbe* is a thick, flat mat of broad leaf strips, stained alternately orange, black and white. All Mangbetus wear them, each district sporting its own design

ALL PHOTOS BY MARTIN BIRNBAUM

(Below and Right) NATIVE BEAUTY PARLOR: Before a ceremony, Tongolo's wives paint their bodies with black and white stripes and spots in attractive designs. Dye is said to come from the juice of a gardenia tree. Their bodies are also covered with intricate tattooing and scarifications, sometimes forming names—perhaps those of admirers. These women's elongated heads were bound in infancy with fibre wound spool-fashion around the skull. Their stools are *objets d'art*, carved from one block of wood, although Tongolo is far prouder of the imported Morris chair, in his new, unfinished brick home. Note the curiously uncomfortable wooden knob of the *egbe* which presses against the woman's spinal base

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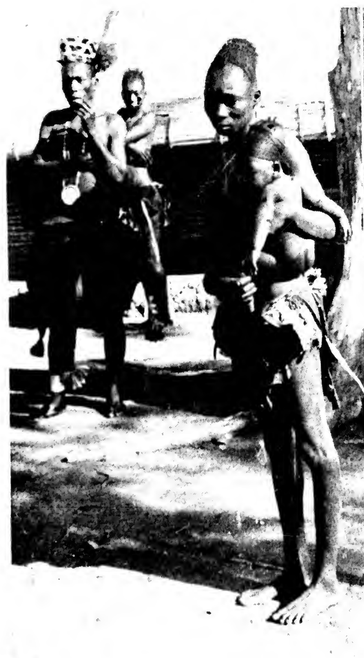

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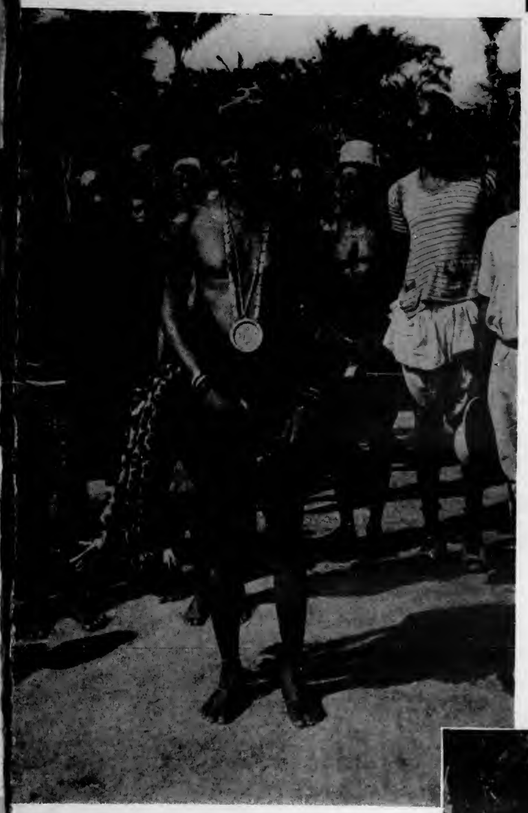
(Left) SIX FEET OF PIPE is joy unalloyed to any of the tobacco-loving Mangbetus. Even the onlookers seem happy. Among them appear an incongruous felt fedora and *(center)* a complete European sports outfit. This gentleman was a plain, everyday Mangbetu until he got hold of the white togs. Then he became cock of the walk and was with difficulty excluded from other pictures taken by the explorers

(Below left) several warriors of Matari brandish spears in friendly fashion. But should they so choose, their metal arrows could work havoc. Tongolo himself finally led his troops in hallooing charges, accompanied by drums and crashing gongs

(Right) THE SAVAGE GRACE of this lithe-muscled Mangbetu soldier typifies the splendid physique of his people

(Below) YOUTH OF MATARI bid the explorers farewell. The impression given by this Mangbetu tribe was that of an intelligent, hospitable and happy people, easily won by necklaces, cloth, and the all-important tobacco. The next stop was the village of Naipou, named after Naipou, its chief, well known for his sagacity. Here the white men were received in style; an orchestra was sent to meet them on the road and escort them to Chief Naipou's council house *(below right)*

BORN ARISTOCRAT and hereditary chief of a century-old dynasty, Niapou met his visitors in befitting manner. Musicians were more numerous, their instruments more elaborate, than those at Matari, and although his costume approximated Tongolo's, Niapou's greater importance is further evidenced by his harem of 400 wives. A few are shown below on the receiving line. Some of the natives wear amulets to appease evil spirits. Their religion combines modern missionary influence with fragments of the old ancestor worship, with its human sacrifices, for which the Mangbetus were once widely feared



ONE OF THE 400 wives of Niapou, wearing a special type of *egbe* made of banana leaves. The more attractive women were prevented from posing by the jealous elder wives. As a whole, the Mangbetus are docile and childlike. Without aspirations to self-government, they feel that their highest achievement can be only service to the white man

(Above) MORE WIVES obligingly pose to show off their headdress. The hair has been plaited like a college mortar-board but round, resting on top of the skull to form a sort of halo. Long pins of monkey bone or silver ornament the hair. Heavily tattooed torsos were in evidence here, as in Matari. The people were a bit shyer and often clapped their hands over their mouths as a sign of astonished embarrassment provoked by the automobile and cameras of the expedition

(Right) ROYAL TRUMPETER with his five-foot horn, partly ivory, covered with leopard skin and adorned with pompons of reddish-orange feathers, plucked from the grey parrot's tail—a favorite Mangbetu decoration. No Louis Armstrong, this trumpeter could produce only a loud animal-like roar which reverberated through the jungle

(Below right) DRUMMER BOYS. One has removed his "ceremonial" fedora before posing with the triangular drums. Ornamented with metal knobs, these and other musical instruments, a few modeled clay pipes and jars were the only evidences of native craftsmanship. Masks, common elsewhere in Africa, are totally lacking among the Mangbetus

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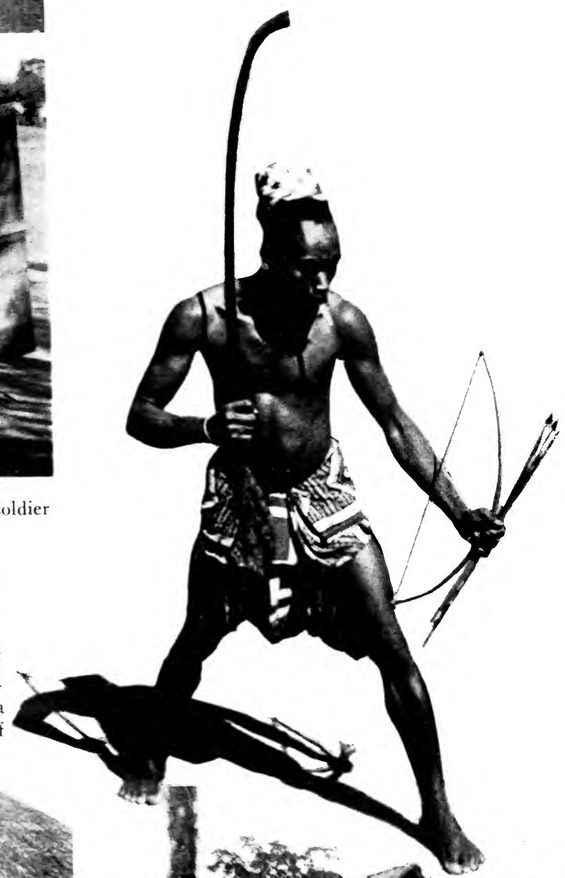

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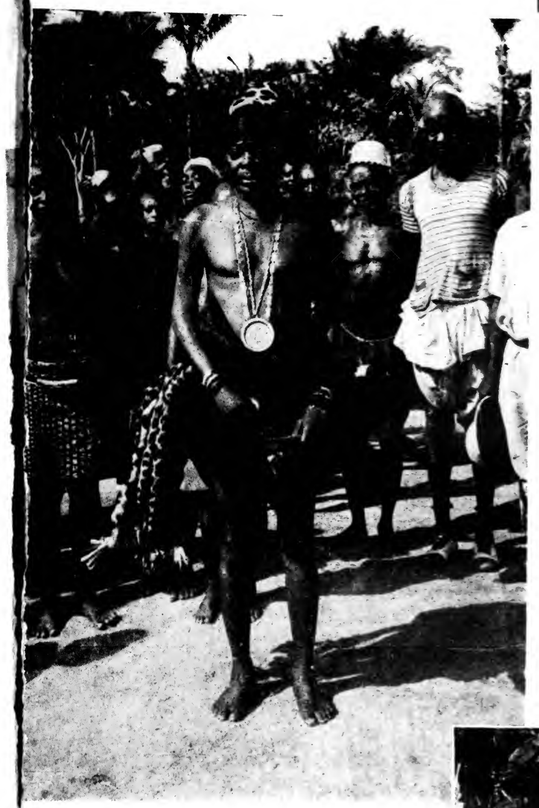

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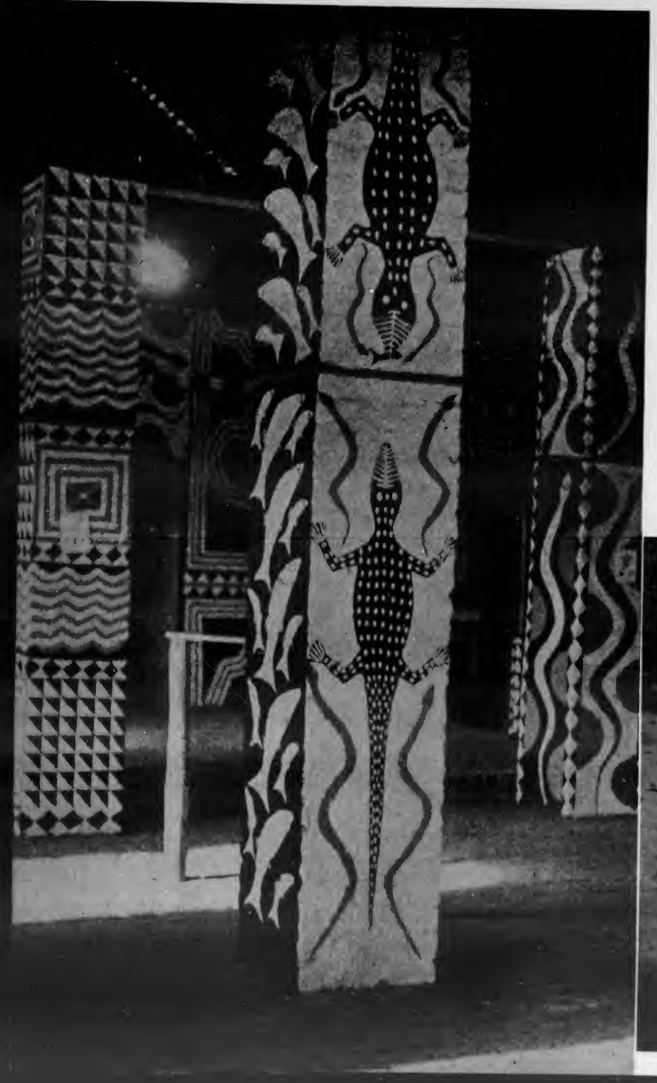
(Right) TOURIST CONSCIOUS Ekibondo proved a decided contrast to the other Mangbetu villages. This was best expressed in its chief—Ekibondo—who, though descended from ancient rulers, was attired in unsavage white duck and wore a wrist watch. The cleanliness, the painstakingly decorated black, white and red walls of the conically thatched huts, the picturesquely placed forest trees which had been left standing here and there in the streets—all gave the effect of a stage setting, closer to the sightseer's idea of Africa than the usual jungle villages



(Left) NO FILM DIRECTOR could ask for a more decorative interior than the private Council Hall of Chief Ekibondo. The many square columns are carved and painted in bright colors that amply attest the persistence of the natives' artistic abilities despite relentless penetration of European goods

(Below) ENCOURAGED by their chief, the village women are always ready to pose for travelers. They publicly dress each other's hair, pound manioc, and sell their *negbes* and neatly woven, crownless hats. Ekibondo has a shrewd eye for business and is enthusiastic about tourists, though probably unaware of the dangers of over-exploitation with the inroads of white civilization

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Pygmy dance

The reception took place in front of the large conference house, which was open to the wind on all sides. The Mangbetus are considered the best native builders in central Africa and such structures are often as much as 150 feet long, 60 feet wide and 50 feet high. To entertain us, a small band of Tongolo's pygmies, about four and a half feet tall, indulged in a round dance—endless repetitions of the same erotic body movements—to the accompaniment of wooden drums and rattles, beautifully woven out of strong woody fibres in the shape of gourds, with seeds or little stones inside. Some of these practically nude little people had tattoo marks and painted designs on their faces, in imitation of their superiors. Patrick Putnam, whom we visited later in his jungle home,* told us that these were Basua pygmies, but their Mangbetu masters called them ***naka*** (singular: ***aka***).

When Tongolo thought we had seen enough of their gyrations, he marched us off to the village proper to present us to his aged and withered mother, and to his first but apparently not favorite wife—for there were 64 others, younger and more attractive. Fourteen sons and thirteen daughters were the offspring of these wholesale unions, and to maintain his position and support his vast family Tongolo had only to prove himself a good tax collector for the Belgian Government. The chiefs receive a percentage of all monies collected, and although the very aged are exempt and certain allowances are made to men with large families, Tongolo's income permits him to buy sophisticated luxuries like Morris chairs, the wooden arms of which ended in Mangbetu heads carved by pupils of the missionaries. With great pride he showed us these in his still unfinished European brick abode, never realizing that we were more interested in the native stools carved from a single block, or in the other household implements, musical instruments and weapons. The Mangbetus have always been famous for their metal work and still make beautiful scimitars. They still smoke pipes five feet long like the one described by Schweinfurth,

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and are expert hunters and fishermen. To the women is left the cultivation of the banana plantations and the patches of beans, corn, pea-nuts, sweet potatos, yard-grass, sorghum and manioc.

We made a round of visits to some of the younger wives, many of them carrying babies with sparkling, bulging eyes, straddled on the mothers' hips. Women generally, enjoy an excellent position and a good deal of consideration in the community. Their children have their heads bound by a ligature of raffia or other fibre, wound around the skull as though it were a spool. The result reminded me of the fashion started in ancient Egypt by the brilliant, long-headed Pharoah Akhnaton. At the base of the elongated skull, the marks of healed scars remain after the bindings are removed, and the eyes often retain an unnatural oriental slant. The adult women accentuate the shape of their heads by dressing their hair in diverse ways, the most peculiar and characteristic style being the broad, flat platter, woven and plaited around a framework at the very end of the skull, like a university mortar-board but round like a halo.

Head binding and intelligence

The mentality of the race is not adversely affected by the malformation. On the contrary, the Mangbetus are among the most intelligent of all the central African peoples. One little boy, who proved to be Tongolo's favorite grandson and toward whom he displayed real tenderness, was an exceptionally bright child and made friends with every white visitor. He accompanied us to the huts of his grandfather's wives, some of whom, probably preparing for some ceremonial dances, were being painted with black and white stripes or spots, in attractive designs. When dry, this coloring matter, which was said to be the juice of a tree belonging to the gardenia family, looked soft and velvety. The bodies of these women were in addition tattooed and scarified with various designs. Some women had names surrounded by symmetrical designs tattooed on their bodies, but I did not inquire whether this was done by admirers—which proved to be the custom among the women attached to the military camp at Costermansville, which we visited a month later. The baffling habit of nodding "Yes" to any question whatsoever confuses the careless investigator, and it is difficult to learn whether such marks are tribal, or made for medical reason, or to indicate rank in society, or are simply ornamental and meant to enhance the attractiveness of the individual. Some of the older men had large holes for plugs in their ear lobes, but the younger generation no longer practices this form of mutilation, although such dis-

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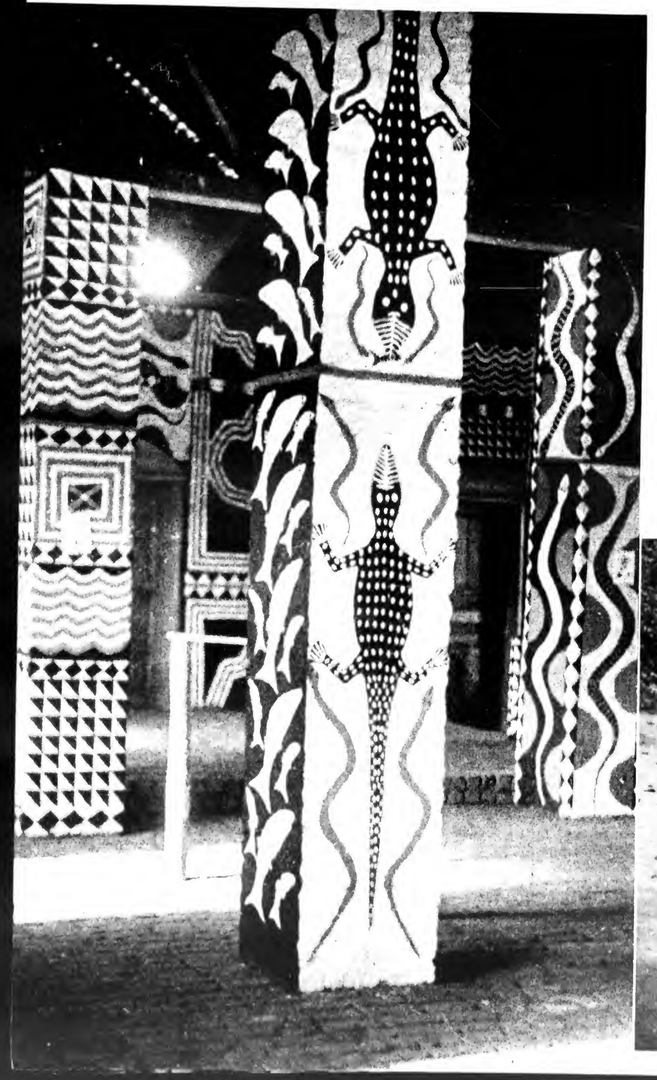

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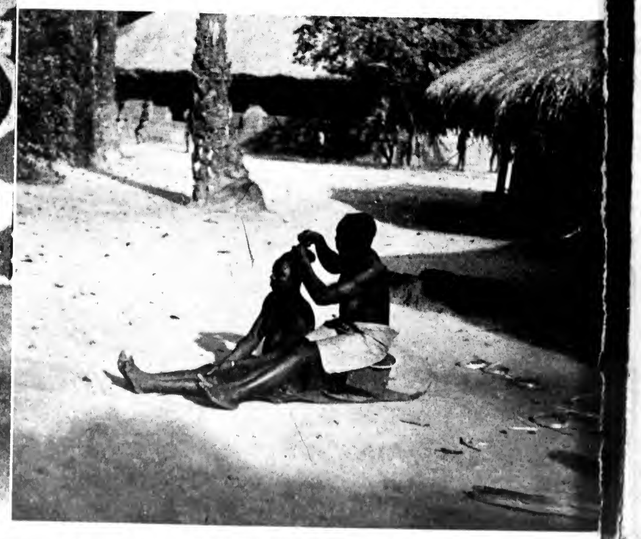

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Head binding and intelligence

The mentality of the race is not adversely affected by the malformation. On the contrary, the Mangbetus are among the most intelligent of all the central African peoples. One little boy, who proved to be Tongolo's favorite grandson and toward whom he displayed real tenderness, was an exceptionally bright child and made friends with every white visitor. He accompanied us to the huts of his grandfather's wives, some of whom, probably preparing for some ceremonial dances, were being painted with black and white stripes or spots, in attractive designs. When dry, this coloring matter, which was said to be the juice of a tree belonging to the gardenia family, looked soft and velvety. The bodies of these women were in addition tattooed and scarified with various designs. Some women had names surrounded by symmetrical designs tattooed on their bodies, but I did not inquire whether this was done by admirers—which proved to be the custom among the women attached to the military camp at Costermansville, which we visited a month later. The baffling habit of nodding "Yes" to any question whatsoever confuses the careless investigator, and it is difficult to learn whether such marks are tribal, or made for medical reason, or to indicate rank in society, or are simply ornamental and meant to enhance the attractiveness of the individual. Some of the older men had large holes for plugs in their ear lobes, but the younger generation no longer practices this form of mutilation, although such dis-

figurations hardly detract from their dusky beauty. All Africans are fond of marking and cutting their bodies, and the fashion among the Mangbetus may be one recently acquired from the tribes they conquered, for Schweinfurth does not speak of it as a common custom. Moreover, the wives of a chief like Tongolo belong to different tribes and often come from other districts—a fact betrayed by the designs of their *negbes* or bustles. The Medje women made a flat geometric pattern of banana leaf strips, stained black and white; the Majogu wives wove theirs of raffia fibre; whereas the commonest type in Tongolo's district was a thick flat mat or layer of broad leaf strips of uniform length and stained alternately orange, black and white.

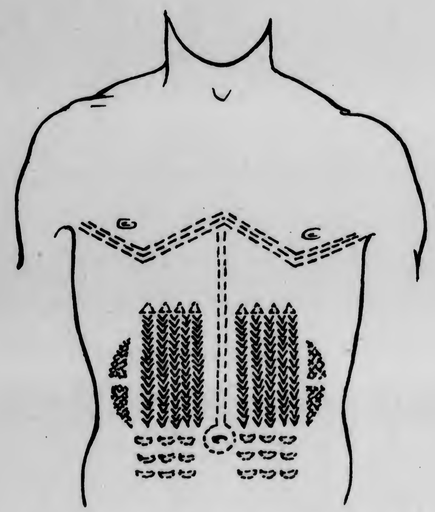
While we were visiting Tongolo's harem, a large number of armed men arrived outside the conference hall to execute war dances and take part in sham battles. The arrows with metal tips, decorated shields and javelins, were all well made, and Tongolo himself led his warriors in their mad charges, while the women hallooed and other onlookers chanted war songs. One felt sure that these splendidly proportioned fellows, often sleek and feline, could be savagely indignant with those who treated them unfairly. The musicians who encouraged them struck triangular wooden drums and blew long horns made partly of ivory. One instrument peculiar to the region, is a painted metal gong, forged in one piece and shaped like two lilies on a single curved stem. The women in the conference hall could not resist the music and were soon dancing round and round in a long file, clapping their hands or waving their arms in every direction, and singing as though their souls were steeped in a fervor of religious sensuality. Two men danced with them, raising and lowering their shields in time, although holding these arms behind their backs. The entire entertainment was an alternation of savagery and naïveté, which make up their character. The noise of the drums, rattles and horns increased in volume when, after having distributed gifts of cloth, necklaces and cigarettes, we bade Tongolo farewell, and a happy, shouting crowd followed us for a time on the road back to Isoro.

We drove along beautiful lanes, shaded by palms and often cut through the heart of the dense luxuriant jungle. Grey parrots and other birds with brilliant plumage were seen, and we often ran down guinea fowl and francolins, which were almost too tough to serve as food. The lovely leaves of the parasolier *(Moussanga Smithi)* were conspicuous everywhere, and in February species of agaves were blooming. Now and again, a dark, frightened face, framed by the green foliage, would gaze for an instant at the swiftly moving, rumbling machine and disappear. Sometimes these natives were painted dead white as a sign of mourning, and the picture they presented was a wierd one. Lonely burial places by the roadside had articles of wear and household implements left on the mound, obviously intended for the use of the departed, but I had no way of learning whether they were Mangbetu graves. The villages we passed were either quite recently built, or abandoned and deserted. The tribes are agricultural nomads, and when the soil around a settlement ceases to be fertile, they move on a few kilometres and plant anew in their primitive, haphazard fashion. To clear the ground for a new village and its plantations, they often set fire to the underbrush, and disastrous forest fires are a common sight. All day, as we motored along, we saw hunters with their bows and arrows, men and women carrying heavy bunches of plantains and bags of raw cotton.

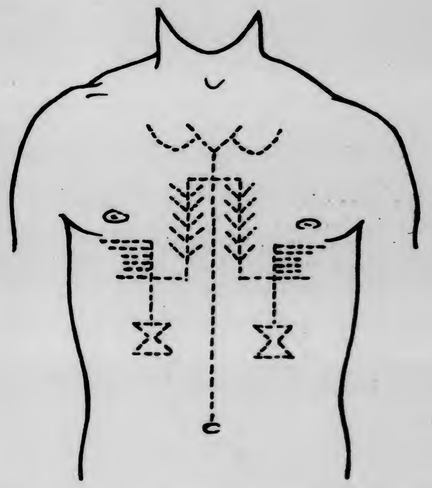
At Abiangama, in a clearing, we came upon the station for which most of them were bound. Here they sold their cotton under government supervision at standardized rates. As soon as it was examined, weighed and paid for, it was removed to the factory close by, to be cleaned and packed by modern machinery. Many of these natives had walked miles weighted down with their burdens, and as soon as they had sold their cotton they rested under the trees and feasted on toasted termites sold by vendors who had bags of them. We did not see an unfriendly looking native in the crowd, and a few drops of eau de cologne poured on their palms sent them into an ecstasy of delight. It was a memorable sight to see the colossal, glistening black frames of the packers emerge from soft white billows of freshly picked cotton; and it would have been interesting to make inquiries about the entire industry, but we were expected at the leper colony at Pawa, in the distant hills, and were obliged to hurry away.

The region we were bound for was superficially very attractive indeed, commanding fine views of the surrounding country. Avenues of chaulmoogra trees led to the village and laboratories, and we were entirely unprepared for the sight of crowds of pitiful remnants of black humanity. Heroic scientists are patiently studying the ravages of the dread disease, and they allow their patients considerable liberty. They are even permitted to marry, for it is known that the children of such unions are not born with leprosy, although they have a tendency to contract the disease. A native chief had been appointed and his subjects seemed surprisingly cheerful. One of the young physicians showed me a collection of live leeches, with which he was trying to establish the proof of his theory that leeches which have once attacked wading lepers can carry the germ by attaching themselves to healthy fishermen. Needless to say we did not leave this depressing community with any feeling of reluctance.

A far pleasanter sojourn was the one at Niapou, named after the famous shrewd chief who rules it. He is recognized as the highest of all Mangbetus, and although his costume closely resembled Tongolo's, his carriage was that of a born aristocrat, a worthy descendant of Nebingbale, founder of the

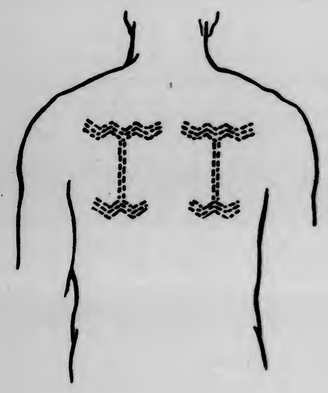


ELABORATE TATTOOING and scarification are a favorite style among the Mangbetus just north of the equator in Central Africa. The design above is tattooed on one of Tongolo's warriors

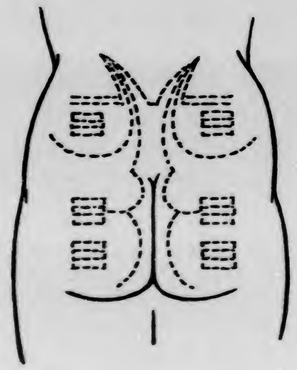


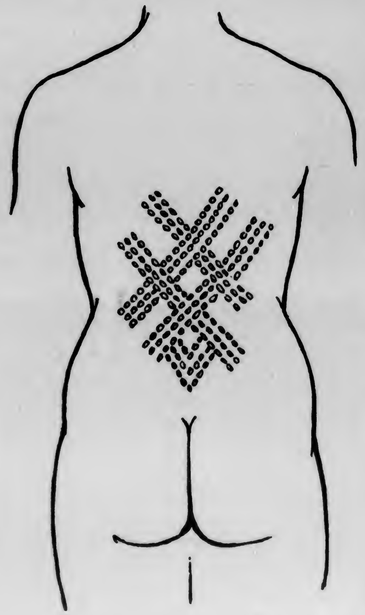
IN THE SAME TOWN, Matari, where Tongolo is chief, the design above is tattooed on the chest of a Mangbetu tribesman. Note the symmetry and delicacy of the native patterns

SCARIFICATIONS like those shown below are bumps of scar tissue standing well above the surrounding skin and are produced by making cuts and preventing their immediate healing. (A Mangbetu woman)



(Left and below) TATTOOED DESIGNS at Matari, the lower one being a characteristic type of which similar examples were seen at Niapou, also in the Mangbetu region





THE PASSION of the Mangbetus for permanent body designs may be a recent acquisition, for Schweinfurth, traveling in the region in the last century, does not mention it as a common custom

dynasty in the last century. To impress us, he had sent his orchestra and a crowd of natives down the road to meet and escort our party to his village, where there was great commotion and everybody was in a frenzy of expectation to see the huge automobile in which we traveled. We learned that covering their mouths as though they were gaping, merely expressed astonishment or embarrassment. It was at once obvious that we were to meet a more imposing personage than the chief of Matari, and the rules of etiquette were here more pompous.

Native orchestra

The musicians were much more numerous and the instruments on which they performed were made with greater skill. Besides the usual rattles, one fellow jingled a large mass of bells attached to a long pole like a bunch of grapes. Others were pounding on cymbals and on the triangular drums ornamented with metal, or on long drums braced between their thighs and covered at one end with snake skin. The most conspicuous instrument was a great ivory horn, about five feet long, covered in part with leopard skin and adorned with the favorite parrot feather pompons. When blown, it sounded like the roar of a wild, infuriated denizen of the jungle. The entire group of performers preceded us to the conference house where Niapou awaited our arrival, seated on a Mangbetu stool placed on a rug of okapi hide, and surrounded by a selected group from his harem of over 400 wives—including the "first," who governed his menage.

I was struck by his composure and the bland serenity with which his eyes peered into mine. He evidently wanted the traditions of the tribe to be meticulously followed. Practically all the women dressed their hair in the mortar-board style, with long pins of monkey bone or even silver, and many had necklaces, bracelets and anklets of ivory, wire, and beads. Their symmetrical tattoo designs on their chests and backs were often mixed with scarification, and one woman had, in addition, five large circular spots painted on her cheeks and chin. As for their nudity, the European soon acquires an intelligent point of view and is no more perturbed by it than by the sight of a naked animal. A missionary may tell you that one feels this way because the natives have not been baptised and are soulless, but in any case the Lido at Venice is a far more embarrassing place than central Africa.

The palavering, the usual dancing and exchange of gifts took place in the great conference house, near which stood Niapou's private brick residence, its veranda protected from the sun by a projecting roof supported by wooden columns carved with reliefs of alligators, fish, European rifles and birds, or with a design resembling a series of Mangbetu stools, one on top of the other.

Native arts

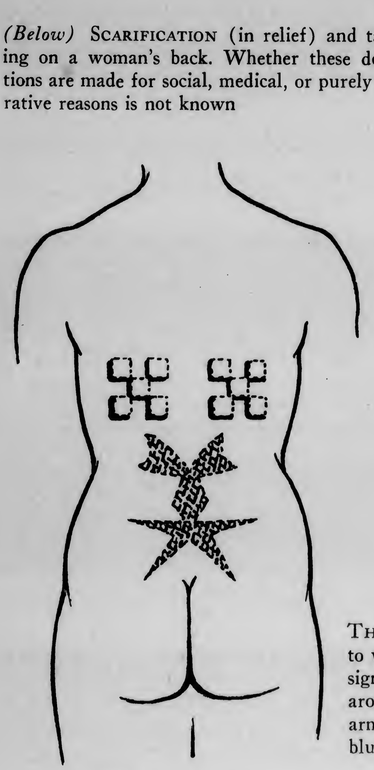
I looked everywhere for other evidences of an artistic bent, but found only a few honey-jars in indigenous design, some earthenware pipes and an ivory handled stick in the shape of an elongated native head. Masks, so common in other African regions, I never saw, and it is doubtful if they ever existed. My lamented friend Alexander Jacovleff, who made some brilliant drawings of Mangbetu types in the course of his visit in 1925, collected some well-made carved horns. Cutlass-shaped scimitars of recent make, similar to the one held by Munza as a symbol of rank in Schweinfurth's frontispiece, were presented to us by Niapou. Later, in the charming ethnographical Museum at Leopoldville, I saw a few anthropomorphic Mangbetu carvings, but unfortunately that institution was founded long after the whole of Africa had been carefully combed for European and American Art Collectors.

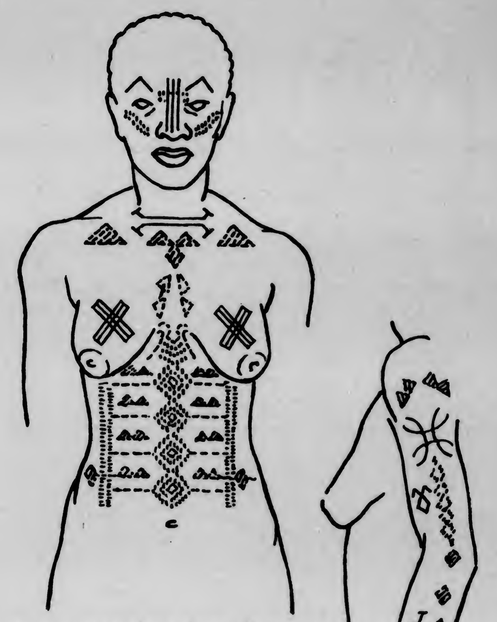
Today their talents are encouraged by the missionaries at Rungu, whom we visited. Brother Marcolin, one of their number, is quite a clever painter and sculptor, and is the moving spirit among the boys who are artistically inclined. Not only did his pupils make good furniture, household tools and objets d'art, but the rafters of the mission church were ornamented with life-sized Mangbetu heads, excellently carved after Brother Marcolin's clay models. The school and workshops are well-appointed, and it was amusing to note that the enthusiastic young students did not shirk their scholastic duties, even when they wore nothing but a thick shirt of fresh banana leaves—a sign that they had only recently been circumcised. Their native religion is a fairly simple one. Although there are no pagan temples or places of worship, they believe in a supreme being and in the existence of powerful evil spirits who have to be appeased. Accordingly, they wear amulets; and "feticheurs" as well as soothsayers, are consulted and feared. That the spirits of ancestors exert an influence on the welfare of the village is another of their beliefs. The human sacrifices, which in Schweinfurth's day took place on the tombs of chiefs, are now, of course, prohibited; but sinister secret societies are dreaded and respected. On the whole, after traveling among them, I reached the conclusion that they are now like docile animals who are taught to think of themselves as children, without knowledge or power to govern themselves. The highest achievement the most ambitious and intelligent can hope to attain is to serve the white man as a bank clerk, a mechanic, a medical assistant, a stenographer or government servant.

From Rungu the moist jungle road—always literally covered with millions of butterflies, which our car mercilessly crushed—ran to a "bac" over the River Dubomokandi. A short distance beyond we motored down an avenue shaded by mango trees and leading into the open square of the village of Ekibondo, named after its chief. Everything here was found to be immaculate and the plaster walls of all the thatched, conically roofed huts were painted with fascinating designs in red, white and black. A few forest trees had been left standing in the village, and the effect of it all is decidedly African. But when I met Chief Ekibondo, dressed in white duck and wearing a wrist watch, I began to suspect that all this charming grouping of forest giants and ornamented huts was done with a keen eye for business. He encourages women to show how they dress their hair, to pound manioc and other foodstuffs in the open, to pose for photographs and sell their *negbes* and neatly woven hats without crowns. His favorite wife's abode was spotless, and I was fortunate to make a fairly successful photograph of the interior of his conference hall, the roof of which was supported by square columns, carved and painted with animal forms and geometrical patterns.

I felt that Ekibondo was as enthusiastic about "tourisme" as Mussolini himself, and I was tempted to give him a bitter account of white exploitation of primitive paradises. Fortunately, perhaps, there was no time. At any rate, he has not yet built a hotel or rest house for whites, and after our visit we hastened away to reach Gangara Na Bodio, the famous station where African elephants are domesticated and trained and where comparatively comfortable accommodations are provided for traveling Europeans.

(Below) SCARIFICATION (in relief) and tattooing on a woman's back. Whether these decorations are made for social, medical, or purely decorative reasons is not known





THE MANGBETU WOMAN above shows the extent to which decorations are carried. There were designs between the hip and armpits as well, and around her waist, which she would not show. Her arms were covered with many scars. The dye was blue-black

THE LONG-HEADED MANGBETUS

SCIENCE NEWS--DEC. 1928

44. NOTES ON THE CULTURE OF THE BUSH NEGROES OF SURINAME (MOTION PICTURES)

MORTON C. KAHN

These people were visited during the past summer, with the Myron I. Granger Expedition of the American Museum of Natural History. The primary object of this expedition was the gathering of an adequate collection showing the art and techniques of the Bush-Negroes, and to this end not only the Saramaccaners of the Upper Suriname river were visited, but collections were also obtained from some Aukaner villages on the Sara Creek.

The motion pictures which are to be shown will illustrate the life of these people, in all phases of which pictures were obtained. The life on the river, which is of vast importance to the Bush-Negroes, since water transportation offers the only means of communication between the villages, must naturally be stressed. There are pictures of the dug-out canoes running the rapids, which are very fast and numerous, and also showing the manner in which the unwieldy rafts of timber, which are floated to Paramaribo to be sold, are manipulated through the difficult places in the river.

Other techniques, such as chipping a log to shape a new canoe, the use of carved combs, the working of the fields, and the winnowing of the rice, the baking of cassava, weaving, and the like, as well as numerous views showing some of the non-material aspects of the life of the people, such as their use of fetiches, as well as general views of the villages and the manner in which the houses are constructed, are included in the pictures to be shown and discussed.

The results which have accrued from this expedition show plainly that the Bush-Negroes represent numerous African elements in their civilization. They leave to be worked out the manner in which contact with European and Indian cultures have affected the mode of life developed by these runaway slaves and their descendants in the South American bush, and how they have succeeded in combining these into a unit.

SCIENCE NEWS--DEC. 1928

32. THE SOCIAL ORGANIZATION OF THE BUSH-NEGROES OF SURINAM

MELVILLE J. HERSKOVITS

The data discussed in this paper were gathered during a field trip to the Saramaccaner tribe of Bush-Negroes during the past summer. In the course of this trip, numerous villages on the Surinam river were visited, and in addition informants were obtained who gave adequate comparative data concerning the culture of one of the two remaining Bush-Negro tribes, the Aukaners. As is known, the Bush-Negroes are the descendants of slaves who escaped from the Dutch during the 18th century, many of them being Africans but a few years in the colony.

The smallest unit of the social organization is the household, which is composed of a man, his wife or wives, and their children. The fundamental element in the society, however, is the 'be, or small family, which consists of persons standing in relatively close relationship through the maternal line. Descent being matrilineal, the father is rather the guardian of his sister's children than of his own. The 'be is exogamous, and, although marriage to a close relative on the paternal side is not regarded as sinful, it is nevertheless not looked on with favor.

The lō, or clan, consists of all persons, related no matter how remotely, in the maternal line. I obtained the names of twelve lō among the Saramaccaners, and my informant stated that there might be a few others, but these are small and unimportant. Among the Aukaner tribe, there are 12 of these divisions. The names of these clans are taken, in the main, from the names of the plantations from which the ancestry of the members are supposed to have escaped,—thus, the descendants of slaves of the Dutch West India Company are called the Kompanyi lō. Among the Saramaccaner tribe, fetich prerogatives are held by some of the lō, while among these people and the Aukaners there are often food taboos associated with membership in the clan.

Although heredity and membership in the 'be and clan goes in the female line, the personal food taboo, the kina or tref, violation of which is thought to result in leprosy, is inherited from the father, and often serves as a test of parenthood.

A complete set of relationship terms was also obtained, including those which are utilized in what may perhaps be termed the joking relationship. Accounts of the system of parent-in-law avoidance, and the attitude toward older brothers and sisters-in-law, to whom remarriage in the event of the death of one's spouse may be compulsory, were also obtained and are discussed in this paper.

An attempt may thus be made in the social organization of the Bush-Negroes to commence the analysis of the manner in which the European, African, and American Indian cultural elements have been combined into an integrated whole.

THE BAY OF ALGIERS WAS ONCE THE LAIR OF CORSAIR

For three hundred years the very name of Algiers sufficed to bring consternation to the hearts of Mediterranean travelers. Its pirates continued to exact tribute from European shipping until finally subdued by the French less than a century ago.

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OLD AND NEW ARE STRANGELY BLENDED IN THIS TERRACED WHITE CITY

Beyond the series of great modern boulevards which rise from the busy water front of Algiers, there are sections of the one-time capital of the Deys which still suggest, in custom and in costume, the time and clime of the "Arabian Nights."

Nat. Geog. Mag. Feb. 1928.

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THE OASIS TOWN OF BOU-SAÂDA ATTRACTS MANY OULED NAÏLS

The girls of this tribe frequently leave their desert homes and go to the more populous cities to earn a dower by their dancing. When they have accumulated a sufficient amount they forsake their art for a home and husband.

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ALGERIAN GIRLS STILL WEAVE "MAGIC CARPETS"

Children are sent to work in rug and carpet factories as apprentices and they produce some fine reproductions of old oriental pieces. This work does not interfere with their education, for the simple reason that girls rarely receive any.

PREPARING THE CHIEF DISH OF THE DESERT

The couscous might be termed the Arab version of an Irish stew and is the *pièce de résistance* of most well-ordered Arab dinners. It consists of mutton or fowl and various vegetables, cooked separately, highly seasoned, and served together with steamed wheat dumplings.

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WHERE THE CENTURIES HAVE SEEN NO PROGRESS

Wheat and other grains are raised in the Algerian oases and are still threshed largely by woman's hand power much as they were hundreds of years ago. Manual labor is far cheaper in the desert than machinery.

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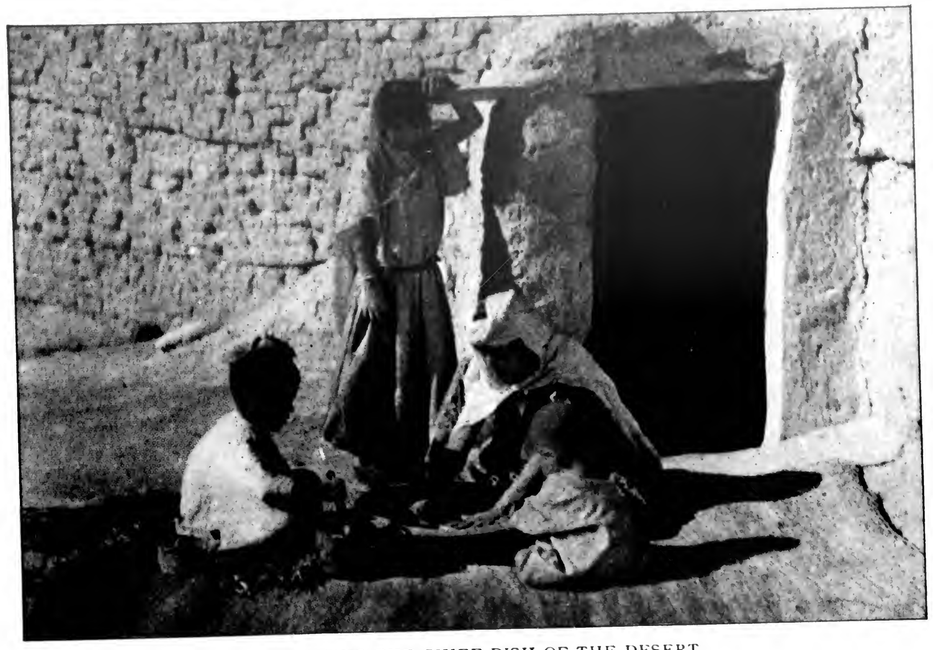

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THE GATE OF THE DESERT

According to Arab tradition the great rift in the rock wall at El Kantara was made by Hercules with a single twist of his foot, to form a gateway between mountains and desert. The place derives its name from the remains of a Roman bridge which are still to be seen near by.

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THE KORAN REPLACES THE THREE R'S IN THIS SCHOOL

In compliance with the injunctions of the Prophet, all Arab boys must learn the Koran. However, the language which they speak has drifted so far away from the pure Arabic of their sacred book that they can not understand passages they memorize, but simply repeat them parrot fashion.

THE ROAD TO GLORY IS SOMETIMES A ROCKY ONE

The heterogeneous individuals who comprise the French Foreign Legion have penetrated the Algerian Desert with good roads. Assignment to a long term of road-building work is one of the punishments for attempted desertion from the Legion.

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FRANCE'S FAMOUS FIGHTERS ANSWER THE MESS CALL

The motto of the Foreign Legion is, "No questions asked," and many a man buries his past under its uniform. The life of the *Légionnaires* seems romantic, but instead is the sternest reality.

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HIS SCARLET CLOAK DENOTES HIGH OFFICE

At the head of each Algerian tribe is a Caïd who dispenses justice according to tribal usage. These men frequently possess marked qualities of leadership and executive ability.

Autochromes by Gervais Courtellemont

THE FAME OF THEIR DANCING SPREADS AFAR

Throughout Algeria the dancing of the Ouled Naïls is known. These girls are very circumspect in their costume but execute a dance that greatly appeals to their Arab patrons.

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WELLS ARE IMPORTANT PLACES IN NORTH AFRICA

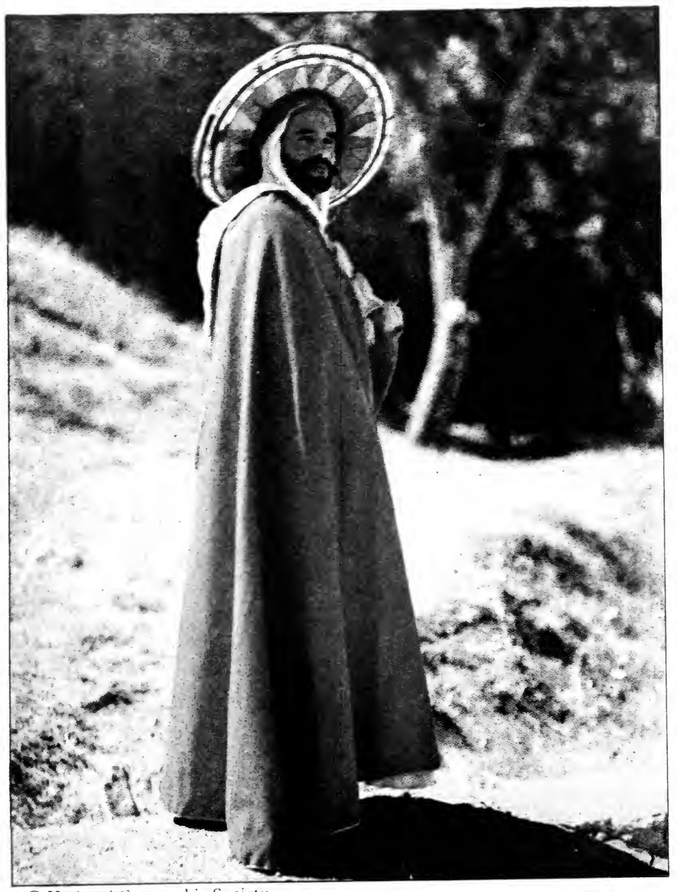
Until the French came to Algeria good water was a rare commodity. They introduced the artesian well to supplement the springs and surface wells of the oases.

Autochromes by Gervais Courtellemont

THESE ARAB BEAUTIES SCORN THE MOSLEM VEIL

City women generally throughout the Moslem world veil their faces, but the Ouled Naïl dancers do not and are consequently considered beyond the pale of polite society.

VI



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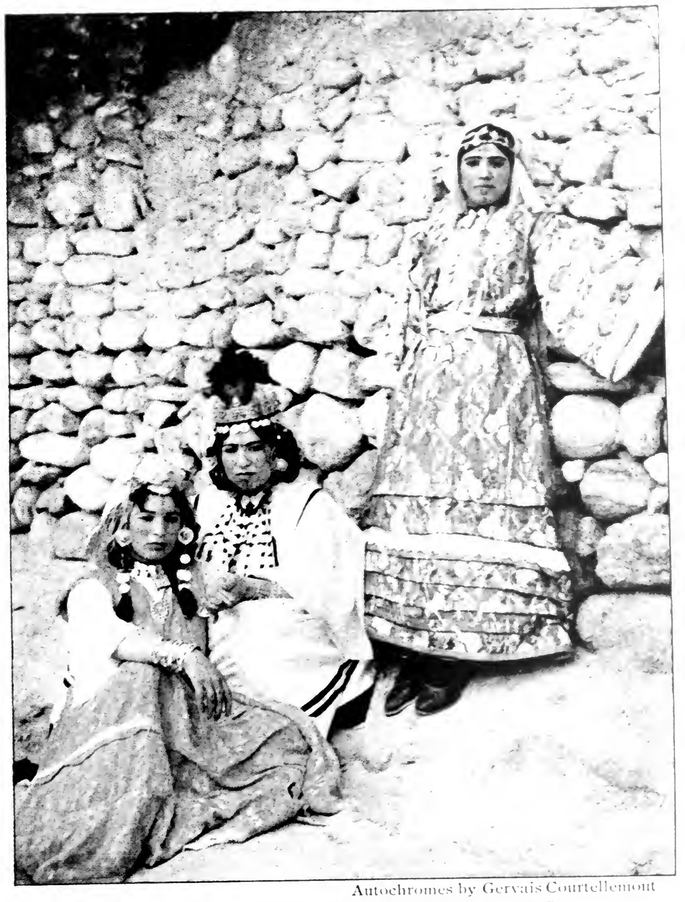

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A WOMAN OF BOUZARÉA DOES HOMAGE TO HER DEAD

On Friday, the Mohammedan Sabbath, only women visit the cemeteries. After attending the graves of their departed, they settle into groups on the grass and engage in a weekly exchange of news and gossip.

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WHERE SONS OF THE PROPHET FIND THEIR LAST REST

Mohammedan burial grounds are accorded high respect, for Moslems reverence their dead. The Prophet decreed that the dead should be carried quickly to the grave, that a righteous person might the sooner arrive at happiness and a wicked one be sooner out of the way.

TREES THAT TRACE AN ANCIENT LINEAGE

The cycads are remnants of the floral life of the world that existed during the Carboniferous age. They are beautiful dark evergreens which, though long-lived, seldom grow as high as these. The French have made the Botanical Gardens of Algiers the finest in North Africa.

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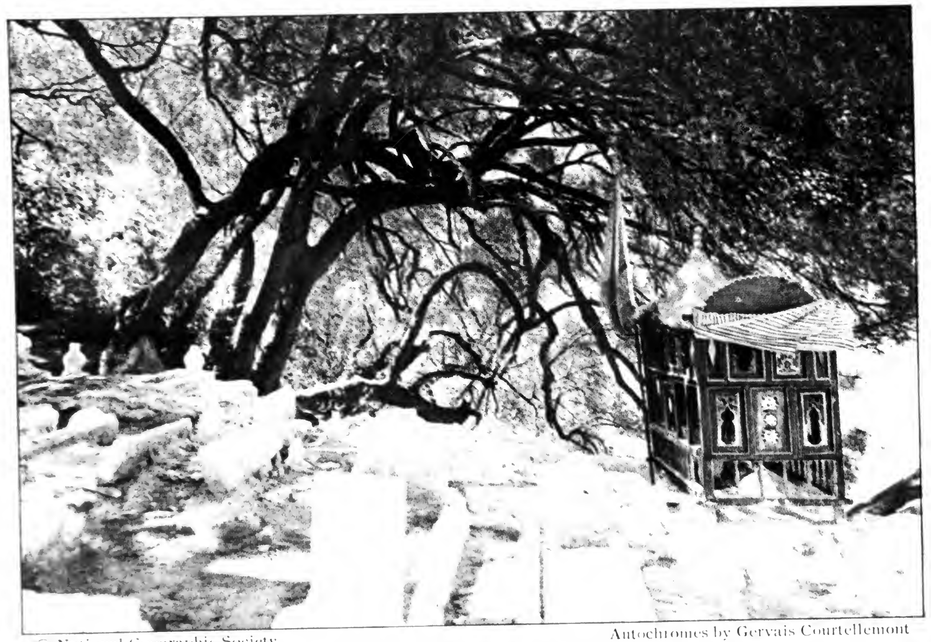
BAKERYMEN DISPLAY THEIR WARES IN BISKRA

Pure-food principles are not seriously regarded by the Arabs and many varieties of edibles are displayed on the street, with no protection from dust and dirt. A good Arab will not eat on the street, however, lest he give offense to some hungry person.

A WOMAN OF BOUZARÉA DOES HOMAGE TO HER DEAD

On Friday, the Mohammedan Sabbath, only women visit the cemeteries. After attending the graves of their departed, they settle into groups on the grass and engage in a weekly exchange of news and gossip.



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WHERE SONS OF THE PROPHET FIND THEIR LAST REST

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THEIR MILLINERY STYLES KNOW SLIGHT CHANGE

A headdress similar to this is supposed to have been worn by the women of North Africa in Punic times. The Ouled Naïls braid and plaster their black hair and then adorn it with gold and silver bands and ornaments that create an effect like stars shining in a desert night.

Autochromes by Gervais Courtellemont

BEAUTIFUL CASCADES ARE FOUND NEAR TLEMÇEN

Once a part of Morocco, Tlemçen presents a more truly Moorish aspect than any other city of Algeria. Situated near the sea at an elevation of about 3,000 feet, it has a delightful summer climate and is a health resort. It is also rich in historical and archeological interest.

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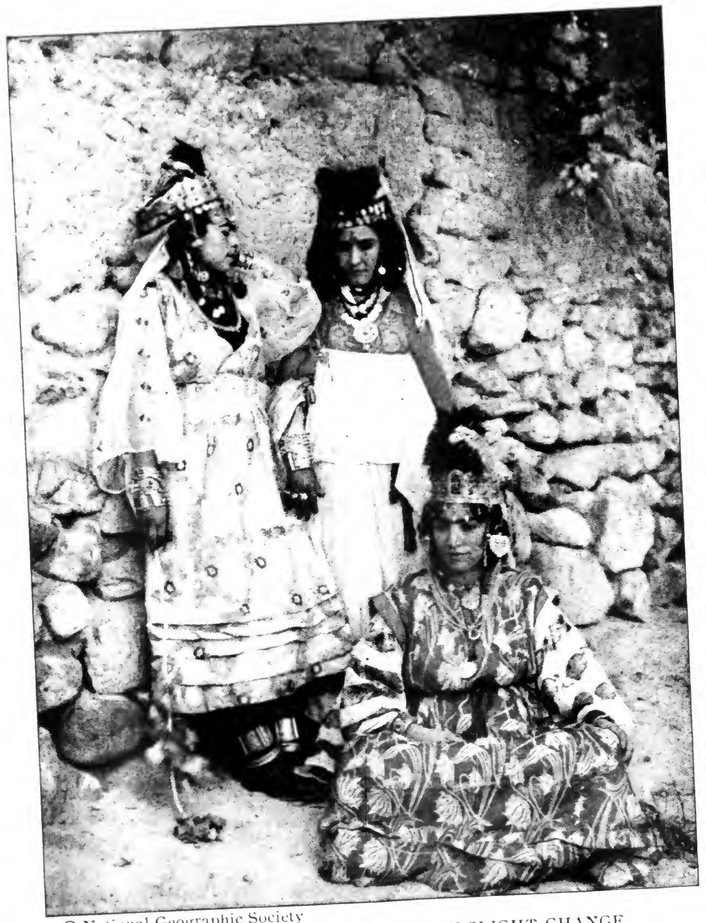
A HEADDRESS WORN ONLY ON FESTIVE OCCASIONS

These caps are richly decorated with embroideries, often in gold or silver thread, and are generally worn with a similarly embroidered silk gown. On the streets Algerian women wear a "fall" veil over the face and a scarflike garment draped over the head and shoulders.

Autochromes by Gervais Courtellemont

A TIME-HONORED CUSTOM

Instead of knife, fork and spoon, the Arab diner usually uses his fingers, consequently the hands are laved both before and after the meal. Children attendants serve the guest with basin and water for the purpose. On the floor at the right is a brass coffee tray.



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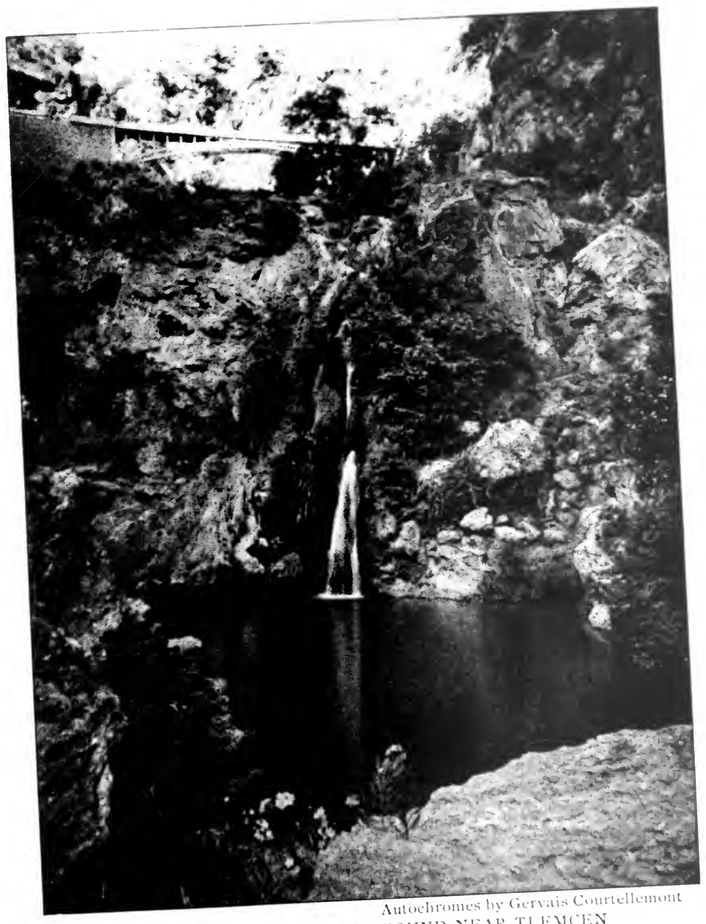

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A MARABOUT BENEATH THE AGE-OLD OLIVE TREES AT BLIDA

The term "marabout" is applied to a Mohammedan holy man or saint and is also used to denote the tomb in which he is buried. These tombs are regarded as endowed with the holy man's sacred character and as such are hallowed places. Blida is a sizable city near Algiers.

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WHERE RICH MAN AND BEGGAR LIVE ALIKE

Among the Kabyles there are few fine houses, even the well-to-do living in primitive fashion. These Berbers have peculiar ideas of property, a man sometimes owning a fig tree but not the land on which it is grown and perhaps not even all of its branches.

DWELLERS IN THE "PLACE OF HAPPINESS"

Bou-Saâda is beautifully situated where desert and mountain meet. It is the nearest oasis of importance to the city of Algiers and is much visited by tourists. The name means "Place of Happiness."

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ALLAH'S GREAT GIFT TO THE DESERT DWELLER

In favored districts the date palm tree sometimes attains a height of 80 feet. In various parts of the desert country it is the only useful plant grown, and its sweet, nourishing fruit is literally the "staff of life" for many nomadic tribes.

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NO WHEELED VEHICLE EVER TRAVELED THIS THOROUGHFARE

The Arab quarter of Algiers presents a maze of steep, winding streets, some of which ascend so abruptly that they become a series of long, sloping steps. The houses that line them project outward on wooden struts until the upper stories nearly touch.

Autochromes by Gervais Courtellemont

A GAILY BEDECKED DAUGHTER OF THE DESERT

She wears the greater part of her fortune on her person. Silver and gold coins, cleverly linked together, and many artfully worked silver bracelets, necklaces, rings, anklets and headbands, some adorned with coral and turquoise, represent her earnings as a dancer.

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A HOUSEHOLD IN BISKRA

All is not beauty and romance in the country of sheiks and oases. Domestic arrangements are often extremely squalid.

Autochromes by Gervais Courtellemont

A QUARTET OF DANCING GIRLS

A pointing hand and a piece of red coral are worn by many Arab women to prevent the baneful machinations of demons.

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Abeokuthans by Gervais Courtellemont

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A polishing hand and a piece of red coral are worth to many Arab women to peer on the bare midriffs of dancers.

© National Geographic Society

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All is not luxury and opulence in the country of shiks and oases. Domestic arrangements are often extremely squalid.

BESIDE STILL WATERS

Wherever there is water the great desert blossoms into a beautiful garden. Here at Bou-Saâda a little river supplies the life-giving element. Numerous French artists have helped to make the beauties of this oasis known to the world.

© National Geographic Society Autochromes by Gervais Courtellemont

AN AFTERNOON "COFFEE" FOR LADIES ONLY

In Algeria, where neither tea nor tables are much used, coffee is the popular drink, and when the ladies gather in their courtyards for an exchange of neighborhood news the coffee tray is placed on the ground and they group themselves around it.

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ENGINEERING

Worm's-Eye and Angel's-Eye Views of New York in Exhibit

World's Largest Diorama, Showing 6,000 Buildings, Will Tell Story of Daily (and Nightly) Life in Metropolis

See Front Cover

VISITORS to New York during the 1939 World's Fair will have the unique privilege of getting a worm's-eye view and an angel's-eye view of the Big City's famous rush hour on one and the same day.

Out-of-towners unused to the mechanics of outwitting subway doors will have their revenge—an opportunity to look down and say, how puny this frenzy seems!

The world's largest diorama, a block-long, three-story-high reproduction of 4,000 buildings that contribute to the fabulous skyline, will show in 11 minutes life in New York around the clock. And its designers didn't forget the rush hour.

As 50,000 watts of power feeding "daylight" into the exhibit die out for the end of the day, the model will show New York motion in all its rush hour frenzy. Elevators in the buildings will rush up and down; trucks, buses and other vehicles will tear back and forth with greater facility than they do in real life; and subway trains will scurry underground, in cross-sectional tunnels clearly visible to the spectator. The sight will be soothing to the most outraged and trampled ego.

Complicated Wiring Job

Involving the most complicated job of electrical model wiring on record, the diorama is sponsored by the Consolidated Edison Company, New York's power merchants. It will be known as the "city of light." The 4,000 models of skyscrapers have 130,000 windows.

A model subway system, whose trains will travel the equivalent of one and a half times around the world during their meanderings in the diorama's bowels, will be a feature. Comprising 57 cars, the tiny trains will draw their power from a third rail and will have a block signal system similar to that used in actual subway operation. The cars are of cast aluminum.

The exhibit was designed by Walter Dorwin Teague. So detailed is it that even the jewelled lights of Coney Island will be shown in the Brooklyn corner of the diorama after nightfall.

During one brief interval in the cycle, seven small circular dioramas within the large one will come into view, showing various phases of city life, including a night baseball game, an operation at the Medical Center and a ballet in the Radio City Music Hall. During another interval, a display showing the tangled maze of electrical wiring, steam, gas and sewer piping that underlies the city will be lighted.

The model buildings are constructed of prefabricated composition slabs, superposed on wooden frames. A steel frame supports the entire structure.

Science News Letter, February 4, 1939

VOLCANOLOGY

Cooling of Rocks Cause of Volcanoes

MANY volcanoes erupt not so much because the molten rocks underneath the earth are still hot but because those rocks are cooling and in cooling they build up greater and greater steam pressures.

To a fireman tending a steam boiler, or to millions of good fathers who tend the family heating plants, this statement may seem puzzling. For they know that higher pressures are built up when a boiler becomes hotter. As it cools the steam pressure falls. And so it is in normal, everyday experience.

Volcanoes, fortunately, are not everyday occurrences on earth. Cooling does produce the great pressure increases which bring forth eruption. Huge quantities of steam liberated by volcanoes are just a way of relieving excessive pressure.

Studies at the Geophysical Laboratory of the Carnegie Institution of Washington have shown that the presence of water, contained in the molten rock, is the key to the seeming paradox.

This water frequently is held in solution by the silicates present. As the molten rock cools some of the silicate minerals are frozen out. The water is left behind but with smaller quantities of silicates present to hold it in solution.

Because of the relatively increased water content the steam pressure exerted by the dissolved water increases even though the rock mass may be cooling. Enormous pressures, built up in this way, are equalized in volcanic eruptions.

These studies, carried out by Dr. G. W. Morey and his co-workers and by Dr. Roy W. Goranson of the Geophysical Laboratory, involve the behavior of water in silicate melts under extreme high pressure in conditions which rival those found far beneath the surface of the earth.

Science News Letter, February 4, 1939

ENGINEERING

Air-Conditioning Attacks Self-Created Problems

WITH AIR conditioning coming into widespread use in larger, public buildings, the heating and ventilating engineers, who have made this advance in human comfort possible, are now faced with some serious problems which they have thus created.

As one example, what health risks are there involved in the recirculation of cool air through a crowded motion picture theatre, restaurant, or office building? It is hardly economical to use the cooled air only once and take in completely fresh air at each cycle in the air flow. Thus only a fractional part of fresh air is taken in.

Since this situation exists, the question arises whether the bacterial content of the air in an air-conditioned building gradually rises. If it does, does it approach a bacterial concentration which is potentially menacing to health?

In hospitals, too, there is the problem of what to do about the ventilation of contagious disease wards from which the air passes into a common system and, potentially, may be recirculated through the whole air-conditioned hospital.

More widely known among laymen is the problem of ridding restaurants and railroad cars of the odor of smoke. Here the problem is complex because it not only involves the cleaning of the air and its recirculation but the removal of elusive odor also.

The research committee of the American Society of Heating and Ventilating Engineers is considering these and other problems. These engineers are formulating experimental projects which will seek the best solution.

The task, they well realize, will be slow, for the problems involve medicine, biology, chemistry and physics as well as engineering.

Science News Letter, February 4, 1939

ETHNOLOGY

Pity the Poor Pharaohs!

Egypt's Ancient Sky Religion Called for Seven-Year Reign; If Pharaoh Wasn't Dead Then He Had to Commit Suicide

By EMILY C. DAVIS

HAVE YOU ever felt sorry for the haughty, glamorous Pharaohs of history?

Ten to one, you never have.

Yet, an Egyptologist now advances the theory that young Tutankhamun and many other Egyptian kings were caught personally in a pitiable trap. Theirs was the same prospect faced by dashing Francois Villon in the romance "If I Were King."

You recall in that story, Villon was made king of France for a day, and cruelly told he must die at the end of it. But long before medieval France, kings of Egypt were actually living out such dramatic episodes, knowing all too well when they took the throne that they might expect to die at a set time. Usually, Pharaoh was allowed seven years to live—a little better than the day offered poet-adventurer Villon, but nothing to make a Pharaoh light-hearted.

Seven Years—and Then!

Seven, perhaps nine, years of glory—and then—!

This theory, that Egypt's rulers were pitiful victims of an ancient sky-religion to which Egypt tenaciously clung, is advanced by G. A. Wainwright, former inspector-in-chief of Egypt's Antiquities Department.

Mr. Wainwright has been reading between the lines in Egyptian history, religion, and legends. What he has found puts an entirely different light on the Pharaohs, and on many a curious turn in Egypt's history.

On the surface, you see the Pharoah as a glittering, enviable figure. Everybody is bowing and scurrying to carry out his whims. He lives magnificently in a luxurious palace. The Nile country is plastered with monuments telling how colossal he is. Millions of people are at his command, to fight his battles or build him a tomb.

All Egypt seems to exist merely to glorify this star—the Pharaoh. But under the surface, there may be personal tragedy.

It goes back, the Egyptologist explains, to beliefs that people in North Africa held long before Egypt became a civilized land. To understand it, you have to think of primitive tribes searching the sky for rain. When the rain fell there was a good crop and plenty of wild game, and everyone could eat and be comfortable. But when rains held off there was starvation and misery.

So in Libya, North Africa, as in many other parts of the world, human beings worried over their dependence on rain. They not only talked about the weather. They tried desperately to do something about it.

Magicians Made Rain

There arose, then, magicians with sky powers, who in time developed into priest-kings. Rain could be brought down, it was believed, by knowing the proper rites and words, and by personal sanctification.

Being the cleverer men of a group, magicians often made good. Success was partly a matter of learning what they could about weather signs—so as to choose likely times for rain-making rites. But if rain failed, the rain-maker was quick to announce that sky-gods were angry with the people's sacrifices or behavior.

Out of such primitive reasoning and faith came Egypt's early sky-religion. Important among the early sky gods was Seth, god of rain and storm, a god to whom the pig and the hippopotamus were sacred. Also, there was Min, an old, old god of fertility, who evolved into Egypt's super-powerful god Amun.

Egypt's kings were close to such gods as these, and supposedly even had divine powers as representatives of the gods on earth. Reduced to practical terms, this meant Pharaoh was charged with Egypt's weather control and health insurance.

In Egypt, to be sure, climate had changed so that rain was no longer the prime need. Rather, Egyptian farmers worried about the Nile. The annual flood of the Nile must be exactly right in quantity to irrigate the fields. It became Pharaoh's business to control the Nile.

Hence, when you read the fantastic string of powers and titles attached to an Egyptian king's name, don't think too scornfully that this was all silly vanity. Some of these titles, like "Lord of the Sky, Lord of the Earth, Leader who directeth the two Banks of the Nile, Lord of Destiny, creating the plenteous harvest," and so on, were the unfortunate man's royal duties. They were set down with precise and terrible realism.

The phrases Lord of the Sky, and others just mentioned, were among those addressed to Ramesses the Second by courtiers on one occasion. Ramesses is one of the Pharaohs who ruled along about the time when the Children of Israel were in bondage in Egypt. Whether it was he, or another Pharaoh before whom Moses and Aaron stood when they demanded that Pharaoh let the children of Israel go, the man on Egypt's throne must have been in an embarrassing spot. He was supposedly god-like in his control of nature. Everybody said so. Yet the Israelite leaders challenged his powers and called down plagues on Egypt in the name of their own god, Jehovah.

Ordinarily, of course, no one checked up on Pharaoh's efficiency as a weather control agency, or as guardian of national life and health. Pharaoh was above that, being divine.

Deadly Last Duty

But being god-like was precisely Pharaoh's dilemma. For, according to the ancient religious reasoning, it was supposed by the masses that the divine ruler could pass on full god-like power to his successor only if he laid down his life in its prime. Pharaoh's last duty was to slay himself or be slain.

Mr. Wainwright explains that this sacrifice has been required of king-priests in many lands and eras. There are tribes in Uganda, Africa, that require the ruler to commit suicide. In ancient Italy at Nemi the divine priest had to be slain by his successor, a runaway slave. In ancient Prussia the divine king used to light his own funeral pyre.

Egypt's traditional ending for a Pharaoh was by fire.

There are classical tales in Egypt about kings who died in this way. And Mr. Wainwright says they are not fairy-tale nonsense. They record "details of the Old Religion and the horrors enacted under it."

directed only against a nation beginning war before submission to the Court or the Council.

In England, after the organization of the American League, a British League of Free Nations Association was formed, proposing a Court and a Commission of Conciliation, the use of force to execute the decisions of the Court, and the joint suppression, by all means at their disposal, of any attempt by any State to disturb the peace of the world by acts of war.

It looked to the immediate organization of a League of Great Britain and her then allies, with a view to the ultimate formation of a League of Nations on a wider basis, including States at present neutral or hostile. It excluded the German peoples until they should bring forth works meet for repentance and become a democracy.

It contained a provision for action by the League as trustee and guardian of uncivilized races and undeveloped territories. It proposed as a substitute for national armaments an international force to guarantee order in the world, and proposed a further function for the Council of the League in supervising, limiting, and controlling the military and naval forces and the armament industries of the world.

HOW FRANCE JOINED THE MOVEMENT

Late in 1918 a French Association for the Society of Nations recommended that the Society of Nations should be open to every nation who would agree to respect the right of peoples to determine their own destiny, and to resort only to judicial solutions for the settlement of their disputes;

That the use of force be reserved exclusively to the international society itself as the supreme sanction in case one of the member States should resist its decisions;

That the allies should form their association immediately and should work it out as completely as possible in the direction of sanctions of every kind—moral, judicial, economic, and in the last resort military—as well as in that of promulgating general rules of law.

The French Society further provided that the Society of Nations thus immediately formed should control and conduct the negotiations for the coming peace.

It will thus be seen that the League of Nations, as conceived by its proponents in three of the four great nations that have won this war, has substantially the same structure. It includes a court to decide justiciable questions, a Council of Conciliation to consider other or non-justiciable questions and to recommend a compromise. It calls for the organization of the combined economic and military forces of the world to enforce the judgments of the court, and to deal with a defiance of the recommendations of the mediating council as the executive body of the League shall deem wise.

JUSTICIABLE AND NON-JUSTICIABLE QUESTIONS DEFINED

The distinction between justiciable and non-justiciable questions is generally clear, although it may sometimes give rise to disputes.

A justiciable question is one that a court would take up for decision and adjudge upon principles of law. A non-justiciable issue is one in which the claim asserted and denied is not rested on legal right, but is based on a policy which the claimant seeks to maintain for its own safety and for the general welfare.

Such non-justiciable claims are to be weighed by the Council of Conciliation in the light of considerations, not of positive law or juridical equity, but in the light of conventional rules of decency, courtesy, neighborly feeling, and morality which the common brotherhood of nations and their general welfare require.

Illustrations may be given. The Monroe Doctrine of the United States was a declaration by the United States that its interests and safety required that it should exclude from the Western Hemisphere interference by European or other governments to overturn any independent government in this hemisphere; that it should prevent further colonization by any foreign government in this hemisphere; and this has been amplified to prevent the transfer of territory in this hemisphere to any foreign government.

The object was to avoid disturbance of the peace by the ambitions and intrigues of European nations against the

French Official Photograph

NATIVES WEAVING MATS IN WHAT WAS FORMERLY GERMAN WEST AFRICA, CAMEROON

"Germany has been as murderous in dealing with the backward tribes of her colonial possessions as she was in Belgium and in northern France." Scandals in the maladministration of Cameroon and in the oppression of the natives under German rule came to light in 1906. Three weeks after the outbreak of the world war British troops from Nigeria crossed the German frontier into this colony, and on February 18, 1916, its complete occupation by the British and French, working in coöperation, was announced (see page 57).

Photograph from Pictorial Press

A STAIRCASE LEADING TO THE TOMB OF A NATIVE CHIEF: CAMEROON

At the beginning of the world war Germany's Cameroon possessions embraced an area of 305,000 square miles—more than four and a half times the area of all the New England States. The native population about equaled that of Massachusetts, but less than 2,000 whites lived in the colony. Although the Imperial Government had been in control of the territory for 30 years, less than 200 miles of railway had been constructed in this, one of the richest regions of tropical Africa.

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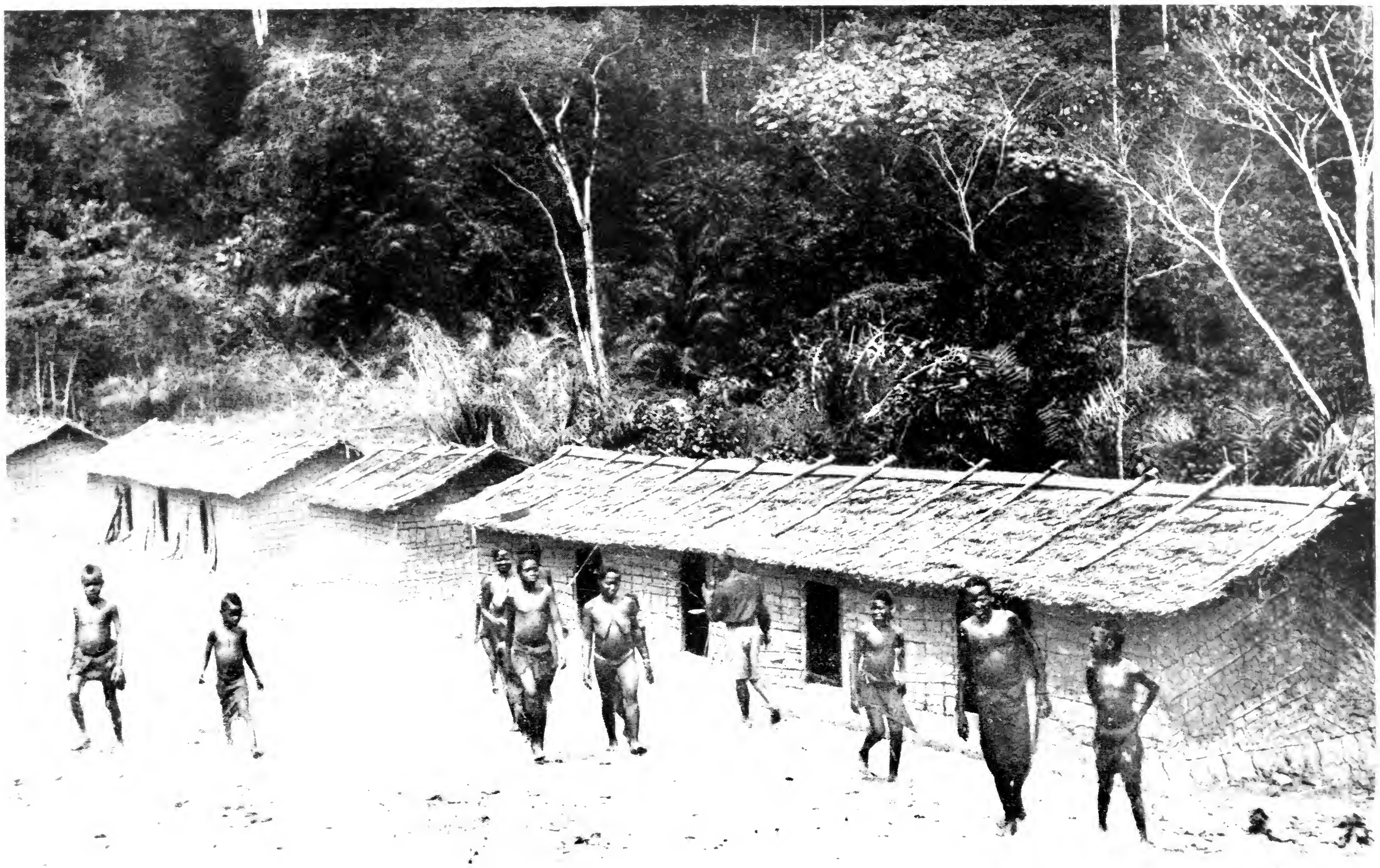
NATIVES IN A VILLAGE OF CAMEROON, FORMERLY A WEST AFRICAN COLONY OF THE GERMAN EMPIRE

"Gemany has forfeited her right to the colonies by her mistreatment of them in the past." The Cameroon country came into possession of the Germans in 1884, when several merchants signed a treaty with the chiefs of Duallaland and a few months later "assigned" their interest to the Imperial Government (see page 57).



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[*Reprinted from* SCIENCE, *N. S., Vol. XVII., No. 419, Pages 75–76, January 9, 1903.*]

NOTES ON NEGRO ALBINISM.

LAST spring, while engaged in archeology work in Coahoma County, Mississippi, I noticed some negro albino children hoeing in a cotton field. The fact that there was more than one in the family led me to make inquiry which brought out the following facts. The grandfather of these children was an albino. He married a normal negro woman and had three normal sons. All three sons married. Two have had only normal children; but the third, who has been twice married, is the father of fifteen children, four of whom are albinos. The first wife had five normal children and one albino; the second, six normal ones and three albinos. I was unable to learn anything about the ancestry of these women.

The particular interest in the case is that the anomaly reappears in one of three lines of descent in the third generation. According to Mendel's law of heredity, we should not expect it to reappear at all. Yet, if we suppose that albinism was recessive in the mothers of these albino children, the observed result is just what we should expect.

These albinos, two of whom have attained full stature, and others in the vicinity, are noticeably taller and have broader shoulders than their normal fellows. Are these accompanying characters?

WILLIAM C. FARABEE.

NOTE ON MR. FARABEE'S OBSERVATIONS.

MR. FARABEE has kindly shown me the proof of his interesting 'Notes on Negro Albinism,' and generously consents to the publication of the following note with his own.

The point needs emphasizing that albinism in mammals in general is a *recessive character* in the sense of Mendel's law. Mr. Farabee writes as if this fact were generally recognized, but I doubt whether this is so. Last winter in my lectures on heredity, which were attended by Mr. Farabee, I showed from the statistics published by von Guaita in 1900 that albinism in mice is a recessive character. This result has been confirmed by Mr. G. M. Allen, who has been carrying on breeding experiments with mice, under my direction, for the past two years. Some results of Mr. Allen's work have been in manuscript for several months, but their publication has been unavoidably delayed. Meanwhile Bateson (1902), in two recent important papers on heredity, has made the first published recognition of the fact that albinism in mice is a recessive character.

During the last few months I have been able to demonstrate experimentally that albinism is a recessive character likewise in guinea-pigs and rabbits. Mr. Farabee's observations indicate that the same is true also in man. It is probable, therefore, that this is a general law of heredity in all mammals. But Bateson has shown that in certain crosses among poultry white plumage is a *dominant* character; consequently we must apparently limit our generalization for the present to mammals. Yet it should be pointed out that the white breeds of fowls used by Bateson in his experiments are not pure albinos, since the eyes, at least, of white birds are pigmented. Consequently we must exercise caution in generalizing from those experiments.

In the case of negro albinism observed by Mr. Farabee, the result is throughout a Mendelian one, on the hypothesis that albinism is recessive. For the original male albino married to a normal negro woman should have only normal offspring, in whom, however, *the albinic character is recessive.* The recorded observation is three sons, all normal.

Two of the sons, apparently, married wives who were 'pure dominants,' *i. e.,* who were entirely free from the recessive (albinic) character. The theoretical expectation in such cases is that half the offspring will be pure dominants, and the other half dominants in whom the recessive character is latent; but both sorts will be alike (normal) in appearance, as actually observed.

The third son appears to have married each time a woman in whom the albinic character was recessive. The probability of such unions is indicated by Mr. Farabee's observations of *other albinos 'in the vicinity.'* For to every albino produced, where crossing with normal individuals takes place, there are certain to be produced *at least twice as many* 'normal' individuals containing the recessive character. If, as supposed, the third son and each of his wives contained the recessive character, we should expect one in four of their offspring to be an albino; the recorded observation is four in fifteen, a close approximation to the calculated result.

W. E. Castle.
Zoological Laboratory, Harvard University,
December 16, 1902.

Natural History, May-June 1928

A Tray for Carrying food

THE BUSH NEGROES OF DUTCH GUIANA

How a Slave Rebellion of Two Hundred Years Ago Freed the African Natives Who Had Been Transported to Serve the Dutch Sugar Planters, and How These Transplanted Free Black Men, Living in the Jungle, Have Carried on the Traditions of Their African Forebears

By MORTON C. KAHN
Cornell University Medical College, New York City

NEAR the northeastern coast of South America, more precisely in the hinterland of Dutch Guiana, there is a unique civilization little known to the white men of this continent. We know much of the strange life of the Congo and of the fascinating customs peculiar to the inhabitants of the African jungle, for a number of explorers have brought from the Eastern tropics the interesting accounts of their experiences. But of the Surinam Bush Negro, Djuka, as he calls himself, who nearly two hundred years ago fought his way from slavery and has since maintained his independence, of the survival of his African customs and craftsmanship, of his medicine and religion, little has been told.

Beginning in the early part of the seventeenth and eighteenth centuries, the Dutch colonial planters cultivated large sugar plantations on the banks of the Lower Surinam and Saramacca rivers in Dutch Guiana. In those days the labor problem was easy: as was the common practice, the planters obtained natives from the West African Coast and compelled the men and women to work as slaves on their plantations. It is of the descendants of some of these African slaves that I write.

In 1750, or thereabouts, a few slaves of the outlying plantations rebelled against their white masters and escaped into the jungle. Others soon reinforced them until their numbers became very formidable indeed. After a series of long and bloody wars, aided by the impenetrable South American jungle, their own bravery, and the sagacity of their leaders, the escaped

THE FIRST GLIMPSE OF A BUSH NEGRO VILLAGE ON THE UPPER SURINAM

The Djuka settlements are situated in the dense jungle on either bank of the river, at intervals of from a half mile to several miles, and ordinarily some distance from the river bank outside the range of any possible inundation. Very often, too, they lie in close proximity to water falls which form some barrier to possible invaders

Negroes gained many victories over the combined forces of the Dutch and British allies. The wise colonial authorities, seeing that any further attempt at recapture was futile, made a truce, and though the attacks upon the Negroes kept up spasmodically for many years, the blacks retaliating by making vicious forays against the outlying plantations, it was finally agreed by both sides to have peace, and complete freedom was granted to the slaves who had escaped.

From that time until the present, the descendants of the revolutionary slaves have remained a free and independent people. Today they live a peaceful, contented, and primitive life in their little villages of thatched huts in the jungles which border the middle and upper Surinam, Marowyne, and Saramacca rivers, and certain tributaries of these great streams.

The Negroes of North America, as well as those of the West Indies and other territories in this hemisphere, have cast off nearly all of their African heritage, completely yielding to the influence of white civilization, eager to immitate its customs and to emulate its standards.

The Djukas are of an entirely different mold. They still cling to a number of the African customs and crafts of their revolutionary forefathers. Many of the slaves who rebelled were born in the colony. On the other hand, the rebel forces contained a goodly sprinkling of recent arrivals from Africa, and although these slaves came from many different tribes, a number of customs and traditions were held in common. Under the patronage of their dusky leaders, the culture of the black men was welded and cherished and that of the white man deemed deeply inferior. This idea, in a modified way, holds even

at the present time. To the Bush Negroes the white man is not a superior being. They realize that "*buckra obeiah bon*" (white man's magic is good), but they are proud of their own, which seems to suit them much better. In a word, they have absolutely no sense of inferiority. On the other hand, many of the Djukas tend to regard the white man as a weaker creature. The Bush Negro's ability to take care of himself under jungle conditions is apt to make him look down on the white man, who is, in truth, at times relatively helpless without the Djuka's aid as paddler, hunter, or guide. On many of the rivers no progress into the interior can be made without their help.

The Djuka finds his own living. Game, fish, oil-bearing nuts, and a little fruit are furnished by the jungle; the land is fertile and, although a terrific battle must be constantly waged to keep out the ever encroaching jungle, as well as insect and bird pests, each village has its little provision ground, which furnishes cassava, yams, peanuts, and occasionally sugar cane and peppers. Curiously, the provision clearing is always situated at quite a distance from the village. Upon inquiring the reason for this, I was told that the custom of having the provision clearing so placed was a survival of the days of the rebellion for, when the white forces discovered a rebel village, it was usually destroyed, but the wily blacks would retire deeper into the forest, far beyond their provision ground, where they would rest in safety, and occasionally send scouts to the clearing for food.

Traders from the Dutch towns come up to the more accessible Bush Negro villages and barter for the hard-wood timber which some of the Djukas cut. While the necessities of these people are never controlled by the whites, the lumber, or the money paid for it, forms a means by which

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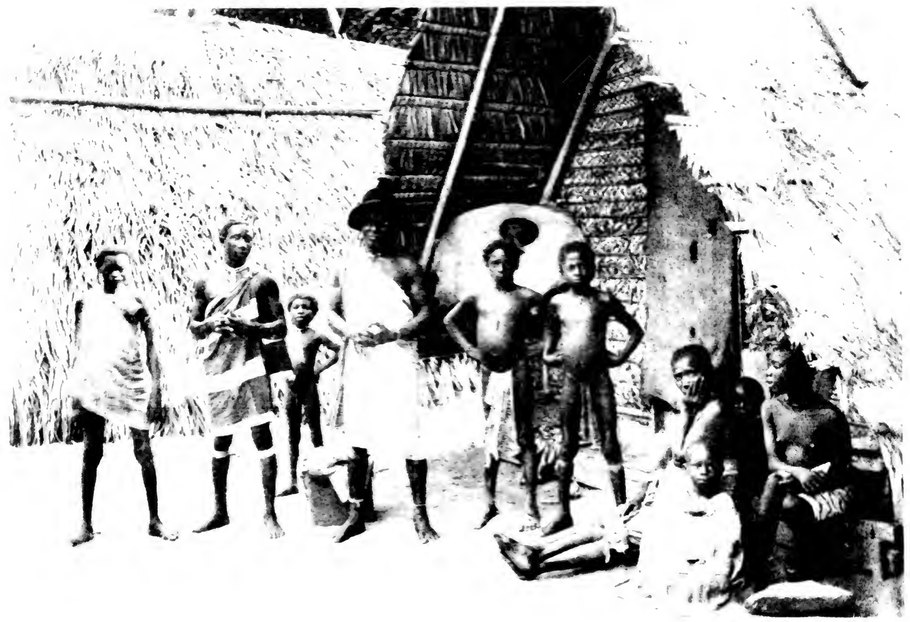

A FAMILY GROUP, LOWER SARAMACCA RIVER

Very characteristically, they wear amulets around their necks, designed to ward off some evil or to invite good luck.

THE APENTI OR SIGNAL DRUM—UPPER SURINAM RIVER
The design *motifs* are those of the snake and the notch. The snake *motif* is practically identical with a similar *motif* often occurring in the work of the West African natives

up the rivers, however, are communities few occupants of which ever come into contact with white men.

Their method of using tobacco is unique to say the least. Instead of smoking as we do, most of them prefer to suck up through their broad nostrils a dark brown fluid made by soaking the tobacco leaf in water, to which a little wood ash has been added. They offer to their guests a small vessel containing this liquid, as we would a package of cigarettes. The noise emanating from such a gathering is great, and I often wondered how the membranes of their noses and throats withstood the constant application of the burning substance.

Besides the protection given them by nature, the Djukas' feeling of superiority is based upon a word of mouth record of their successful war for freedom. This has been maintained from generation to generation in a sort of saga in which the names of the leaders, the stories of the battles, the anecdotes of magic protection against white man's bullets, and the instances of individual heroism and cleverness have been preserved. The history is told in a literary or ceremonial language, which, so I am told, is composed largely of modified African words. It is noble speech, or "deepee talkee" (deep talk) and unintelligible to othersthan the Bush Negro. The cook on my little expedition, a Negro from the Dutch town, was entirely unable to understand it. The common speech of the Bush Negro is "talkee talkee." This is spoken by all of the natives of Dutch Guiana save the aboriginal Indians, and even by some of them. It is a mixture of Dutch, French, English, and African words, with a dash of Portuguese for good measure.

Curiously, upon constant inquiry, I was surprised to learn that the Djukas have no memory or cognizance of Africa; their history, as far as they are concerned, dates from the rebellion, and they have no knowledge of their origin prior to that time. My chief paddler, Quacoe, had an African name of important significance. Although he was doubtless named in honor of the famous Bush Negro rebel chief, the name was originally that of a king of the Ashanti people on the West African Coast.

Another remnant of culture strongly suggestive of the dark continent is the highly developed system of drum telegraphy found among the Surinam River Djukas. Besides the call "white man comes," I have heard others which were interpreted to me as "come quick, sick" "call the Gran Man" (captain) "come to the meeting," etc. Some of the natives use the drum upon which to talk to their "Gran Gadu" (great spirit), feeling that the throbs of the instrument are more likely to reach their celestial destinations than mere words or thoughts. News of one's arrival is anticipated in the same way by this tom-tom code, and if the visitor has made a bad impression, this negative report is well known up the river. In this case the blacks will refuse to trade or assist the offender, and uncomfortable indeed is the plight of one so greeted.

In many parts of Africa one finds the

they can purchase shotguns, brightly colored cloth, brass wire coils, and tobacco. They also barter for axes, shot, powder, knives and other iron ware; for, while the Bush Negro deems it a disgrace to bring anything into the village that can be made by him, he is not averse to trading for the articles mentioned above. The bright cloth is used for raiment that is worn as a sort of toga. People clothed in this manner are to be found in many parts of the West African Coast. The brass wire coils are used for ornamentation, especially by the women, and are wound tightly about their arms and legs, a custom distinctly African in its origin. Far

ELABORATELY CARVED WOODEN STIRRING PADDLES
Like every other implement or utensil in constant use, these food paddles are decorated with the traditional patterns

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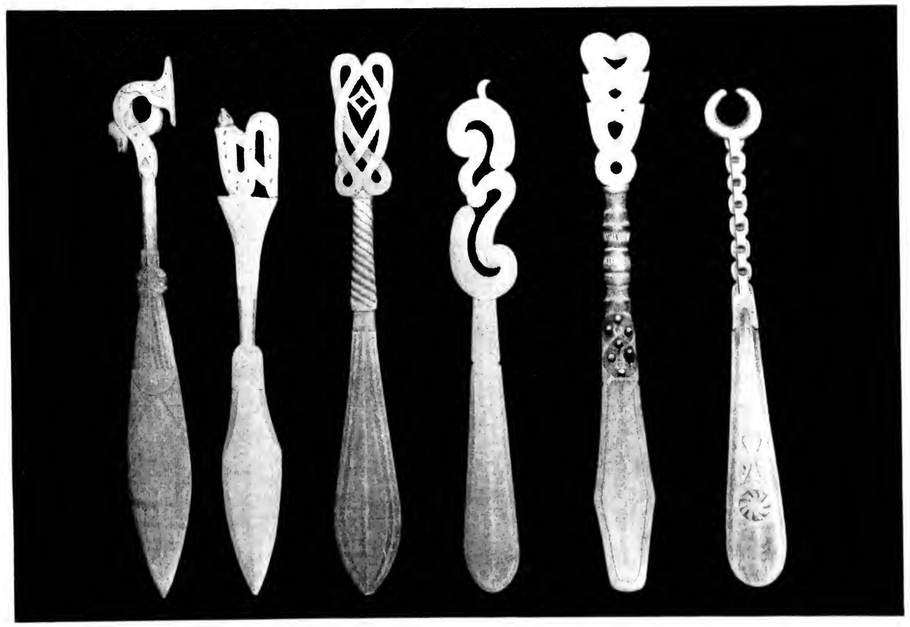

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FASHIONS IN COSTUME ON THE MIDDLE SURINAM
The cloth of which these highly original garments are made comes through traders who operate along the rivers

curious custom of skin decoration by cicatrization. This practice is found widespread among the Djukas. A number of incisions are made into the flesh of the face, arm, back, thigh, or abdomen, with a sharp knife, and into these cuts finely ground charcoal is rubbed. The wounds are arranged so as to form a design of geometrical proportions and, when healing is completed, these form a pattern of scar tissue welts. This custom of decoration is common among the women, and few have any claim to beauty without a pattern cut at one place or another upon their anatomy.

The Bush Negroes in the upper reaches of the rivers are deathly afraid of the French incorrigibles, and justly so; for these convicts, who escape from time to time from the penal colonies in adjacent French Guiana, in their desperate attempt to gain freedom by the overland routes through the forest, have, so I am told, attacked Djuka villages, murdered men, ravaged native women, and stolen provisions, thus making themselves formidable enemies of the black men. It is said to be the custom among the more remote villages to shoot these convicts on sight when encountered, and many harrowing tales seep down from the far interior, of fierce and bloody pitched battles fought in the eternal twilight of the jungle or along the swift streams, for the Djuka first and last protects his own.

The artcraft of the Bush Negroes is by far the most outstanding of their many interesting characteristics, and certainly makes an indelible impression. As far as my limited experience will allow, I must say that I do not know of any existing aboriginal people in the Western Hemisphere in whom the artistic impulse is more highly developed, or among whom artistic ability and attainment play a more important part in the social structure. While collecting specimens of their wood carvings for the American Museum of Natural History, I found that they were not at all anxious to part with these implements, and finally traded with me only because I offered an exceptional inducement, and because my guide explained that

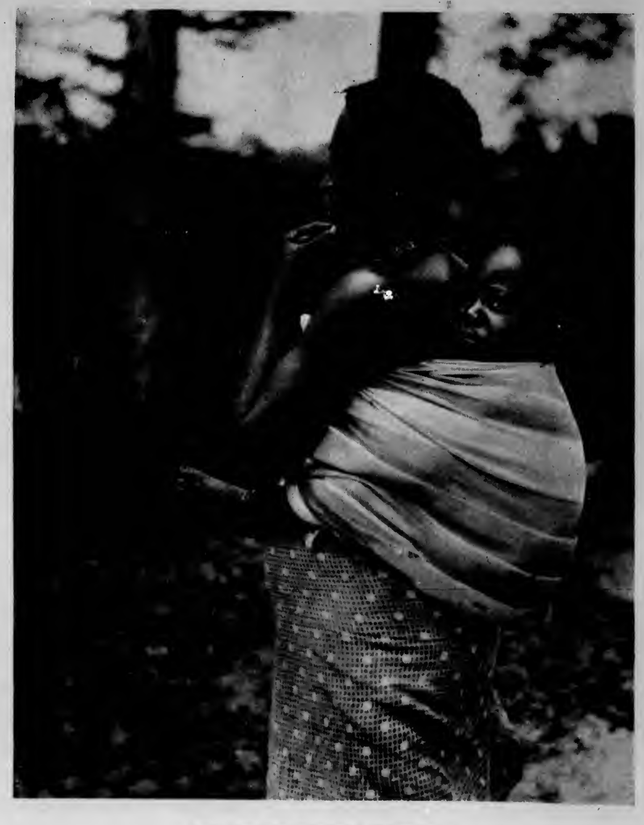
I had come a long way and that the products of their craft were to be greatly admired.

On the middle and lower Surinam River I found that money and leaf tobacco were the chief means by which trade could be effected, but as I journeyed farther back into the interior on the Surinam, the value of the "guilder" decreased and that of tobacco increased until, finally, in the more remote villages, toward the end of my trip, the leaf was the sole means by which any trading could be done. After many unsuccessful attempts, I finally secured the most highly prized of all of their possessions, the elaborately carved telegraph drum or apenté, and then only because its owner had been lately ostracized from his village and traded with me for provisions. However, one young lady voluntarily gave me a bracelet of delicately filed iron because, as she claimed, my eyes put her in mind of those of her husband, lately deceased, so it may be inferred from this incident that sentiment is not entirely absent among them.

The man who is able to carve in wood artistically is looked upon with high favor by the women of the tribe and is also respected by members of his own sex. Of course, the ability to hunt, fish, and successfully provide for a family are qualities essential in every young man seeking a mate, but these are widespread and almost taken for granted, for there are few Bush Negroes who cannot hold their own on the game trails or along the swift rivers.

By the same token, many of the men are able to make these wonderfully artistic wood carvings, and the women seem to require that their households be provided with implements of a highly decorated nature. Sloppy or careless artistry is, so I am told, taken as additional grounds for divorce (a divorce being easily acquired by women in any event).

Thus the Djuka men decorate practically every implement which is used in the daily life of the tribe. Small wooden paddles made simply for stirring cooking food, are, as may be seen from the accom-



AN AID TO BUSY MOTHERS
The baby is carried on the mother's back, face forward, with feet straddling her waist, and is held firmly in position by a wide band of cloth tied around her body

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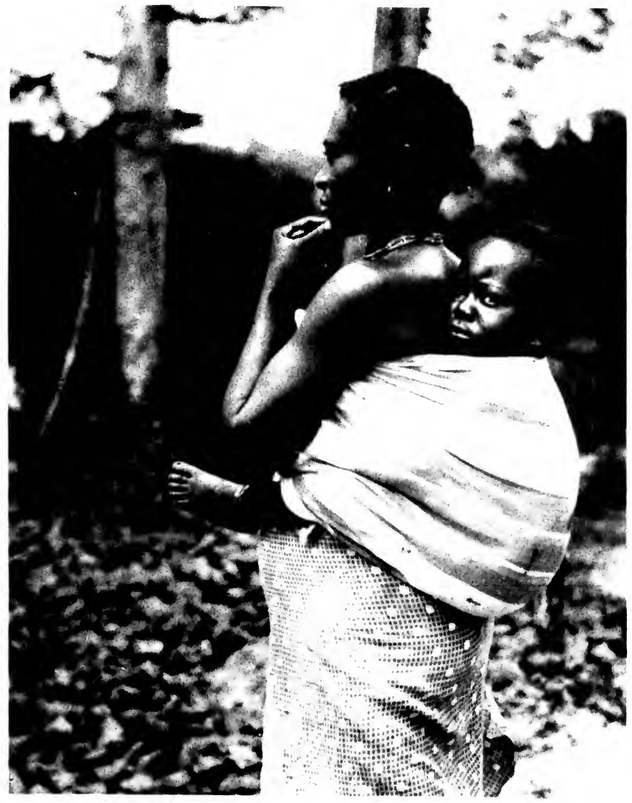

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CLEARING IN A BUSH NEGRO VILLAGE—UPPER SURINAM
The four-walled huts, with low, overhanging, thatched roofs that successfully shed the heavy tropical rains, surround the clearing, though in no fixed positions

panying illustrations, highly and artistically carved in one or more of the traditional designs. Graceful canoe paddles, especially those which are used by the women, are similarly decorated. The low stools and benches upon which the natives sit truly call for superb efforts on the part of the wood-carving artist. Combs used for combing their kinky hair, which are not even worn as ornaments, the small, low tabourettes which serve at times as tables, the calabash gourds which are used for plates and spoons, are always splendidly decorated, delicately and symmetrically designed.

Experienced ethnologists who have made a special study of Negro art—Gerhardt Linbloom, and others—have arrived at the conclusion that this art work and the *motif* displayed, though now modified to some degree, are very probably a survival of the African heritage.

Linbloom states that the snake *motif* shown so often in Djuka carvings is very closely related to designs of the same character found among the tribes of African Guinea and Dahomey. Other units of decoration he has been able to trace to the Ashanti and Benin people. The wooden combs, with their gracefully pierced ornamental work, are an almost unaltered remnant of African origin, as they are being made and used today by the Negro tribes in the northern part of the Ivory Coast Colony and other regions of Africa as well. Specimens of these combs taken from many parts of Africa may be found in the collections displayed at the American Museum but, curiously, they are not as delicately wrought nor as symmetrically carved as are those made by the Djuka artist in the South American jungle, four thousand miles and two hundred years away from his fatherland.

Many other instances could be given to show how closely related to West African art is that of the Bush Negro, especially to that found on the Gold and Slave coasts and in the Cameroon. The districts mentioned are among those from which large numbers of blacks were shipped to the Americas and in all probability the similarities are not accidental. Further, the snake designs which occur so often are religiously emblematic for the Bush Negro and likewise in West Africa, where at Dahomey and Whydah, whence came so many thousands of slaves, snake worship has one of its principal centers.

When one considers that the tools used by the Djuka wood carver are cheap trade knives and dividers, and that the smooth finish is usually accomplished by the use of a mat of grass dipped in fine river sand, one cannot help but be amazed at the beauty of the workmanship.

If space permitted, many interesting things could be told of the rebellion, and of the religion, medicine, and government of these people; how they believe in a supreme God, a ruling spirit over all things but, besides, have a number of minor deities such as the alligator, silk-cotton tree, and a type of boa constrictor that accompanies their voodoo ceremonies; how they allow their dead to remain for days in the tropical heat before burial. Much could be said of their obeiah priests and witch doctors, of their famous snake-bite cure made from the roasted head and tail of a venomous snake. This concoction is highly prized even in Dutch towns and is believed by many also to have the power to turn poisonous reptiles from one's path.

Then there is the sacred medicine city of Dahomey (pronounced "Daumay") far up the Surinam River. White men are not permitted to enter it, for it is thought that the god who hovers over this sacred precinct would be offended at their presence. Here the seriously ill are brought from near-by villages and ministered to by special witch doctors. It is said that miraculous cures are often effected.

One cannot close without a word concerning the benevolent rule of the highly

BUSH NEGRO MAN OF THE LOWER SARAMACCA RIVER
He wears the abbreviated toga-like garment which is put on only when strangers are present or when he is visiting an alien village. This upper drapery, which is also worn for ceremonial occasions, is usually a patchwork of brightly colored pieces of cloth covering the right shoulder and leaving the left shoulder bare. Ordinarily, his only clothing is a breechcloth held in place by a string around the waist

CLEARING IN A BUSH NEGRO VILLAGE—UPPER SURINAM
The four-walled huts, with low, overhanging, thatched roofs that successfully shed the heavy tropical rains, surround the clearing, though in no fixed positions

panying illustrations, highly and artistically carved in one or more of the traditional designs. Graceful canoe paddles, especially those which are used by the women, are similarly decorated. The low stools and benches upon which the natives sit truly call for superb efforts on the part of the wood-carving artist. Combs used for combing their kinky hair, which are not even worn as ornaments, the small, low tabourettes which serve at times as tables, the calabash gourds which are used for plates and spoons, are always splendidly decorated, delicately and symmetrically designed.

Experienced ethnologists who have made a special study of Negro art—Gerhardt Linbloom, and others—have arrived at the conclusion that this art work and the *motif* displayed, though now modified to some degree, are very probably a survival of the African heritage.

Linbloom states that the snake *motif* shown so often in Djuka carvings is very closely related to designs of the same character found among the tribes of African Guinea and Dahomey. Other units of decoration he has been able to trace to the Ashanti and Benin people. The wooden combs, with their gracefully pierced ornamental work, are an almost unaltered remnant of African origin, as they are being made and used today by the Negro tribes in the northern part of the Ivory Coast Colony and other regions of Africa as well. Specimens of these combs taken from many parts of Africa may be found in the collections displayed at the American Museum but, curiously, they are not as delicately wrought nor as symmetrically carved as are those made by the Djuka artist in the South American jungle, four thousand miles and two hundred years away from his fatherland.

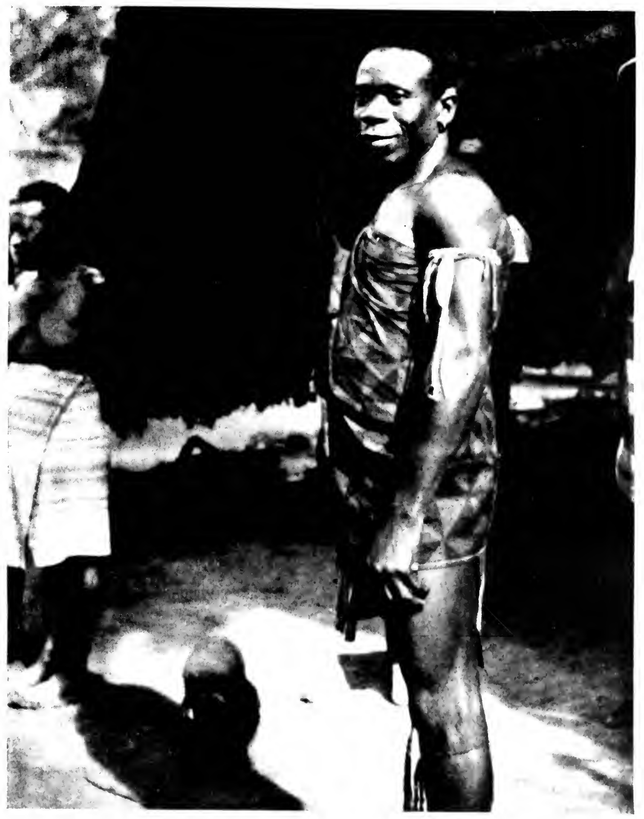
Many other instances could be given to show how closely related to West African art is that of the Bush Negro, especially to that found on the Gold and Slave coasts and in the Cameroon. The districts mentioned are among those from which large numbers of blacks were shipped to the Americas and in all probability the similarities are not accidental. Further, the snake designs which occur so often are religiously emblematic for the Bush Negro and likewise in West Africa, where at Dahomey and Whydah, whence came so many thousands of slaves, snake worship has one of its principal centers.

When one considers that the tools used by the Djuka wood carver are cheap trade knives and dividers, and that the smooth finish is usually accomplished by the use of a mat of grass dipped in fine river sand, one cannot help but be amazed at the beauty of the workmanship.

If space permitted, many interesting things could be told of the rebellion, and of the religion, medicine, and government of these people; how they believe in a supreme God, a ruling spirit over all things but, besides, have a number of minor deities such as the alligator, silk-cotton tree, and a type of boa constrictor that accompanies their voodoo ceremonies; how they allow their dead to remain for days in the tropical heat before burial. Much could be said of their obeiah priests and witch doctors, of their famous snake-bite cure made from the roasted head and tail of a venomous snake. This concoction is highly prized even in Dutch towns and is believed by many also to have the power to turn poisonous reptiles from one's path.

Then there is the sacred medicine city of Dahomey (pronounced "Daumay") far up the Surinam River. White men are not permitted to enter it, for it is thought that the god who hovers over this sacred precinct would be offended at their presence. Here the seriously ill are brought from near-by villages and ministered to by special witch doctors. It is said that miraculous cures are often effected.

One cannot close without a word concerning the benevolent rule of the highly



BUSH NEGRO MAN OF THE LOWER SARAMACCA RIVER
He wears the abbreviated toga-like garment which is put on only when strangers are present or when he is visiting an alien village. This upper drapery, which is also worn for ceremonial occasions, is usually a patchwork of brightly colored pieces of cloth covering the right shoulder and leaving the left shoulder bare. Ordinarily, his only clothing is a breechcloth held in place by a string around the waist

A WITCH DOCTOR'S HOUSE—UPPER SURINAM RIVER
Medicine and its ceremonial accompaniments are the prerogatives of the Djuka witch doctors who, in their healing, use roots, herbs, nuts, etc., gathered in the jungle

efficient Dutch authorities, who give these black children free range of the rivers and jungle and treat so kindly their "Gran Gran Man," or river king, when he comes down annually for counsel with the Governor at Paramaribo, and lastly of the Djuka's great courage and his splendid work as a river man, in his frail dugout canoe, completely mastering the mighty streams and fierce treacherous rapids. The Djukas are a proud people, deserving admiration and respect, and a people well adapted to their environment.

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PALEONTOLOGY

Africa, Not Asia, Seen As Birthplace of Humanity

Evidence Unearthed in Tanganyika Territory Leads to Conclusion of British Authority, Geological Congress Hears

AFRICA was the original center of humanity, the scientific "Garden of Eden," Sir Arthur Smith Woodward, the British authority on ancient man, has concluded.

For some time it has seemed probable that the birthplace of true men, the kind of human beings living today, must have been south-central Asia, but Sir Arthur in a comprehensive paper delivered to the International Geological Congress meeting in Washington has summoned facts that convince him that Africa is the birthplace of humanity.

Most important is the recent skeletal evidence unearthed in Tanganyika Territory, Africa, by Dr. L. S. B. Leakey, that a kind of man lived there very early in Pleistocene or Ice Age that resembled very closely ourselves. This is taken as an indication that the modern type of man appeared much earlier in Africa than in Europe or Asia, although in tool making and presumably in general skill he has not advanced farther than cousin kinds of man, not in the direct line of descent of modern man, which existed at the same time in remote parts of Europe and Asia.

There are four types of mankind, which disappeared before the rise of true men to domination of the earth. One of these is the Piltdown dawn man, Eoanthropus, discovered in England. Another is the famous ape-man of Java, Pithecanthropus. Contemporary with these also is the Heidelberg man, known only by one lower jaw found in Germany, who Sir Arthur doubts really deserves the name Homo. Most recently discovered but of equally great antiquity is Sinanthropus, China's fossil man. All of these are regarded as offshoots from the human stem, sort of unsuccessful experiments of nature as compared with modern man and his ancestors.

Extinct also is the Mousterian or Neanderthal man who was widespread in Europe at a time that is geologically less remote than the opening chapters of Pleistocene time during which the other extinct types lived. The Neanderthals were a second and later offshoot from the human family tree.

So a clearer picture of the human past has been drawn. A million years ago, more or less, at the beginning of the Pleistocene there were five kinds of men existing in different parts of the world. All arose from a common animal ancestor. One was destined to evolve into ourselves. Sir Arthur suggests an intensive search of the earlier layers of the earth in Africa, the Miocene and Pliocene deposits, for earlier evidence of man's rise in the evolutionary scale.

Not all anthropologists and paleontologists studying ancient man agree with Sir Arthur. Many hold fast to the idea that further research in Asia will unearth the ancestors of true man and that the true man found by Dr. Leakey migrated to Africa from Asia.

Science News Letter, August 5, 1933

Journal Heredity, Vol. 21, No. 5. May 1930.

RACE SEGREGATION IN SOUTH AFRICA

New Policies and Factors in Race Problems

A REMARKABLE pronouncement on race questions appeared in a lecture by General Jan Smuts, delivered recently at the University of Oxford. It is titled as "The Native Policy of South Africa," and undoubtedly will mark a turning point in the history of race relations in the British Empire. The racial experience of South Africa is embodied in a closely-reasoned statement, new views are set forth, and old absurdities left behind. Considering the subject and the occasion, a more effective presentation would be difficult to conceive.

The ideals of race relations developed and followed in the last century are formally condemned and abandoned. The essential differences of the races are not ignored or minimized. A biological viewpoint is closely approached, if not definitely attained. Instead of a future of amalgamation and assimilation of the African and the European races, which reckless reformers have projected, the outlook presented for South Africa is to separate communities which are to remain distinct and develop on different racial lines. The native system of tribal organization is to be carefully preserved in the future, instead of being displaced by European control. This change of policy is held to be justified by the deepest consideration for the natives, and as the only practical alternative to social and political chaos which missionary efforts in Africa have tended to bring about.

Such reactions in South Africa undoubtedly will affect other countries and arouse more interest in the study of the race problems in the United States. More adequate knowledge is the only hope of relieving the sectional tensions that still distort our national life, two generations after the close of the Civil War. The reasons given for the changed policy in South Africa need to be checked carefully from the standpoint of our American race questions.

The New Objective

"The new departure is most far-reaching and has come none too soon. Already the African system is disintegrating everywhere over the whole African continent. Many factors have combined to produce this situation. Missionaries share the blame with administrators, the fight against the native religious ideas has been no less destructive than the deposition of native chiefs and the institution of European organs of government. Unfortunately the earlier efforts of missionary enterprise were made without any reference to or knowledge of the peculiar native psychology, or the light which anthropology has thrown on the past of human cultures. For the natives religion, law, natural science, social customs, and institutions all form one blended whole, which enshrines their view of the world and of the forces governing it. Attack this complex system at any single point, and the whole is endangered. The introduction of the Christian religion meant not only the breakdown of the belief in primitive spirits, in magic and witchcraft, and the abandonment of the practice of polygamy; it meant the breakdown of the entire integral native *Weltanschauung* or outlook on life and the world. A knowledge of anthropology would have enabled the missionary to differentiate between what was barbaric and degrading in the native system and what was merely different from the Christian European system without being morally or socially harmful to the natives. But for the missionary good and bad and indifferent in native practice were met with the same ban, so long as it was not in the Bible or the advanced practice of Christian Europe. The whole tendency of the Christian mission has therefore been to hasten the disintegration of the native system, both in its good and its bad aspects. To this has been added the introduction of the white man's administration through his own official organs, the breakdown of the authority of the chiefs and the tribal system, and the loosening of the bonds which bind native society together, with the consequent weakening or disappearance of tribal discipline over the young men and women of the tribe. The general disintegration has been powerfully reinforced by the improvement of means of transport, the opening of communications and labour

recruitment which have led to the movement of natives and their mix-up on a scale which would have been impossible before. The events of the Great War on the African continent have also contributed to the general disintegration. If the bonds of native tribal cohesion and authority are dissolved, the African governments will everywhere sit with vast hordes of detribalized natives on their hands, for whom the traditional restraints and the discipline of the chiefs and the elders will have no force or effect. The old social and religious sanctions will have disappeared, while no new sanctions except those of the white man's laws will have been substituted. Such a situation would be unprecedented in the history of the world and the results may well be general chaos. The natives of Africa have from time immemorial been subject to a stern, even a ruthless discipline, and their social system has rested on the despotic authority of their chiefs. If this system breaks down and tribal discipline disappears, native society will be resolved into its human atoms, with possibilities of universal Bolshevism and chaos which no friend of the natives or the orderly civilization of this continent would contemplate with equanimity. Freed from all traditional moral and social discipline, the native, just emerging from barbarism, may throw restraint to the winds and give free rein to the brute that is in him even more than in the civilized European. Such a breakdown must be prevented at all costs, and this should be done in a way which will continue to maintain in the future the authority which has guided native life in the past. In the interests of the native as well as those of the European administrations responsible for their welfare, we are called upon to retrace our steps, to take all proper measures which are still possible to restore or preserve the authority of the chiefs, and to maintain the bonds of solidarity and discipline which have in the past supported the tribal organization of the natives. This authority or discipline need not be exercised in a barbarous way and should be shorn of all its old-time cruel or other undesirable features. But in essence it should be maintained, and under the general supervision and check of the European magistrate it should continue to be exercised. Special means should be taken to instruct chiefs in their duties, and the sons of chiefs and headmen should be trained to the proper, exercise of the leadership which they may be called upon to fill. Such schools already exist, not only in South Africa, but under the Tanganyika and Uganda administrations, and may prove most helpful in preserving the traditional native chieftainship and headmanship as a vital link in the organization of native society."*

The tendency of missions undoubtedly has been to break down the controls exerted through tribal customs and superstitions. Without the sanctions of cruelty and fear, the authority of the chiefs may be difficult to maintain. The natural inclinations of negroes are not to monarchic control, or to other specialized forms of social organization. Negroes are gregarious, and perhaps for that reason are not socially minded. Primitive people with group habits of life apparently do not develop civilizations. Living in separate families apparently is necessary to provide constructive associations of parents and children, so that the experience of the race can accumulate.†

Except for maintaining the authority of the chiefs, the proposed segregation of the races apparently is analogous to the establishment of reservations for tribes of Indians in the United States. This reversal of policy is held to be necessary as a means of preserving the racial heritage of the African. Carried to a logical conclusion, such a program of racial patriotism might call for the restoration to Africa of other portions of the race, isolated in foreign countries.

Helping free negroes from America to return to West Africa was one of the first efforts for solving the race problem. Liberia was established as a colony of American negroes, but the undertaking was thoroughly mismanaged and was bitterly opposed by the Abolitionists, as "in league with slavery". The civilized negroes in Liberia, as studied by the writer many years ago, had a prospect of which they were not assured in America. The negro shows to better advantage

*Smuts, Jan C. *The African World*, No. 1412, Vol. CIX, Saturday, Nov. 30, 1929, Page xii.

†Cook, O. F. 1912. Definitions of two primitive social states. *Jour. Wash. Acad. Sci.* 2:125-129.

against his native African background than anywhere else.

Different Policies Compared

It is clear that a race so unique and so different in its mentality and its cultures from those of Europe, requires a policy very unlike that which would suit Europeans. Nothing could be worse for Africa than the application of a policy, the object or tendency of which would be to destroy the basis of this African type, to de-Africanize the African and turn him either into a beast of the field or into a pseudo-European. And yet in the past we tried both alternatives in our dealings with the natives. First we had looked upon the African as essentially inferior or sub-human, as having no soul, and as being only fit to be a slave. As a slave he became an article of commerce, and the greatest article of export from this continent for centuries. But the horrors of this trade became such that the modern conscience finally revolted and stamped out African slavery peacefully in the British Empire, but in America with the convulsions of civil war and a million dead. Then we changed to the opposite extreme. The African now became a man and a brother. Religion and politics combined to shape this new African policy. The principles of the French Revolution which had emancipated Europe were applied to Africa; liberty, equality and fraternity could turn bad Africans into good Europeans. The political system of the natives was ruthlessly destroyed in order to incorporate them as equals into the white system. The African was good as a potential European; his social and political culture was bad, barbarous, and only deserving to be stamped out root and branch. In the British possessions in Africa the native just emerging from barbarism was accepted as an equal citizen with full political rights along with the whites. But his native institutions were ruthlessly prescribed and destroyed. The principle of equal rights was applied in its crudest form, and while it gave the native a semblance of equality with the white, which was little good to him, it destroyed the basis of his African system which was his highest good. These are the two native policies which have prevailed in the past, and the second has been only less harmful than the first. If Africa has to be redeemed, if Africa has to make her own contribution to the world, if Africa is to take her rightful place among the continents, we shall have to proceed on different lines and evolve a policy which will not force her institutions into an alien European mould, but which will preserve her unity with her own past, conserve what is precious in her past, and build her future progress and civilization on specifically African foundations. That should be the new policy, and such a policy would be in line with the traditions of the British Empire. As I said on an occasion which has become historic: the British Empire does not stand for assimilation of its peoples into a common type, it does not stand for standardization, but for the fullest freest development of its peoples along their own specific lines. This principle applies not only to its European, but also to its Asiatic and its African constituents. (Smuts, *l. c.* p. x.)

The new policy is credited to Cecil Rhodes, including the proposal "to restore direct native rule to the natives in their local tribal affairs". Many writers have assumed that the negro was degraded through slavery from high standards of native attainment, as may be implied in the reference to "his African system which was his highest good." It may be that General Smuts sees in the native system something of greater value to the Africans than their contacts with the white race, but these encouraging features are not stated. This is a critical point which should be met clearly, in view of the strictures on missionary policy. If the native system has real values it undoubtedly should be rescued and restored. Otherwise the appeal to the race to "build her future progress and civilization on specifically African foundations" will prove quite as illusive as the man-and-brother formula of equality that was expected to re-create the African. The difficulties of the African field have made it a special challenge of faith. A "saved savage" seemed a greater miracle of grace, a greater "adventure of the spirit" than converting a civilized sinner. The out-pour of missionary enthusiasm in the last century has been as remarkable as the Crusades, and the ultimate effect may be as far from the original purpose.

It may appear that more effective control can be exercised through the tribal system than by treating the natives as members of white communities, but the system is now to be "shorn of all its old time cruel or

other undesirable features". The customs of communal land-holding especially are condemned as wasteful and destructive, and are to be replaced by "better methods of agriculture". The forests and the soil are to be preserved by establishing "a general system of individual agricultural holdings" in place of the shifting tribal habits. A highly developed art of agriculture will be needed if the land is to be kept in permanent cultivation, as now proposed.

Effects of Native Agriculture

. . . . The native system of land socialism is not only primitive but most wasteful in its working. Why should the native farmer improve and render productive what belongs to the community and may be taken away from him by the community? The result is that these communal farm lands rapidly deteriorate and become exhausted, and have to be abandoned after a few years' use. Then the farm lands shift to another area of the tribal domain where the same process of uneconomic exhaustion is repeated. And in the course of years this shifting cultivation works havoc with the natural resources of the domain; the soil is progressively exhausted, the forests and trees disappear, the natural vegetable covering is destroyed, soil erosion sets in, the rainfall is lessened, and what water does fall flows off in torrents, arid conditions arise, and the tribal lands become a barren waste. This sad phenomenon can in one degree or another to-day be seen all over the African continent. Not only in South Africa, but in many other parts of the continent a native area or reserve can be recognized at a distance by the obvious general deterioration of the natural vegetation and the soil. But for the enormous natural resources and recuperative power of the continent, most of Africa would by now be a howling wilderness, because of the wasteful rural economy of its population. Unless the carrying capacity of the land is to be gravely impaired in the future, steps will have to be taken everywhere to preserve the forests and the soil and to teach the native better methods of agriculture. Practical agricultural education must indeed become the principal subject of native education. But nothing will have a more far-reaching effect than a general system of individual agricultural holdings under proper safeguards. The economic incentive to use properly and to improve what is one's own is more powerful than any other factor of progress. In a world tending more and more towards general socialism, the vague phrase of "native socialism" may sound attractive, but its practical effects in Africa are everywhere devastating, and it has on this continent significantly maintained the most backward conditions to be found anywhere on the continents of the world. (Smuts, *l. c.* p. xii).

Nevertheless, the "wasteful rural economy" is an essential feature of the native tribal system. Imposing the European system of individual holdings, and giving the natives "practical agricultural education", will be as long a remove from the usual conditions of tribal life for the African as it is for the Indians in America, when their tribal lands are allotted and farmed individually. With the African natives protected from wars, epidemics and famines, the problems of over-population may be encountered in a few generations.

No intimation is given of the effect that this new policy of agricultural development of the natives is to have on the white population, whether the structure of white civilization is still to rest on native labor, or is to be made self-supporting. The need of separate communities is insisted upon, but this is urged entirely on the ground of the assumed advantage to the natives. The existence of "detribalized" natives is recognized as one of the difficulties of applying the new policy in the Cape districts, and the new communities farther north are urged to apply the new policy "from the very start."

Need of Separate Communities

. . . . . The old practice mixed up black with white in the same institutions, and nothing else was possible after the native institutions and traditions had been carelessly or deliberately destroyed. But in the new plan there will be what is called in South Africa "segregation"—separate institutions for the two elements of the population living in their own separate areas. Separate institutions involve territorial segregation of the white and black. If they live mixed together it is not practicable to sort them out under separate institutions of their own. Institutional segregation carries with it territorial segregation. The new policy therefore gives the native his own traditional institutions on land which is set aside for his occupation alone. For agricultural and pastoral natives large areas or reserves are set aside, adequate for their present and future needs. It must, however, be admitted that in South Africa grave mistakes in the past have rendered the setting aside of sufficient lands for the natives impossible at present. For urbanized natives who live as domestic servants or industrial workers in white areas, townships or "locations," as they are called, are set aside adjoining to the European towns or cities. In both rural reserves and town locations the natives take a part in or run their own local self-government. Such is the practice now in vogue in South Africa. The system is accepted and welcomed by the vast majority of natives; but it is resented by a small educated minority who claim equal rights with the whites. It is, however, evident that the proper place of the educated minority of the natives is with the rest of their people of whom they are the natural leaders and from whom they should not in any way be dissociated.

. . . . . If we had to do only with the tribal native voters, the question would not be so difficult, and the application of the general segregation principle to the particular case of political rights might be justified. Unfortunately very large numbers of detribalized natives are spread all over the Cape and are no longer resident or registered in the native areas. These urbanized natives constitute the real crux, and it is a difficulty which goes far beyond the political issue. They raise a problem for the whole principle of segregation, as they claim to be civilized and Europeanized and do not wish to be thrust back into the seclusion of their former associations or to forego their new place in the sun among the whites. With the application of strict education and civilization tests it would probably be the better course to allow them to exercise their political rights along with the whites. Were it not for the case of the urbanized or detribalized natives, the colour problem, not only in South Africa but elsewhere in Africa, would be shorn of most of its difficulties. And the situation in South Africa is therefore a lesson to all the younger British communities farther north to prevent as much as possible the detachment of the native from the tribal connection, and to enforce from the very start the system of segregation with its separate native institutions (Smuts, *l. c.* p. xiii).

The segregation policy, like slavery and emancipation, may be viewed as an effect of economic conditions and advancing civilization. Economists have pointed out that the system of slave labor became too expensive to be maintained, and other race contacts are proving too expensive. The tendency of the races to draw further apart is indicated in the United States, hardly less than in South Africa. The contacts tend to be limited to hours of employment, and the range of employment becomes more restricted. Testimony agrees that mixed associations are vastly less at the present time than in the days of slavery. Reports of abnormal conditions in Harlem and Chicago are not significant, since urban negroes are eliminated even more rapidly than whites.

Lack of employment for educated negroes no doubt may help to produce the effect that General Smuts desires, of making them function as leaders of their people. Many are serving as agitators against social inequality, which negroes are now being taught to resent, though slavery was not resented, and was a native African institution. White masters were preferred by the slaves, and the preference of intelligent negroes for white communities shows the same inclination, but often is blamed as a lack of "race loyalty," the new virtue that white negrophiles have invented.

The motive of civilizing and Christianizing the negro served in one century as an argument for slavery, in the next century as an argument for emancipation, and now appears as an argument for segregation, under the new proviso of guarding and preserving the distinctive characteristics of the negro. That both races apparently are being handicapped and perverted by the existing relations, strengthens the argument for segregation, even if no prospect is seen in the "African system". The northern Abolitionists believed that emancipation would place the negro on the same footing as white farmers and wage-earners, but the general effect has been to reduce the rural white population to the economic status of the freedmen, as tenants and share-croppers. The rapid extension of the crop-loan system has

led to the present "farm crisis". A peasant class of low-standard dependent farmers is being bred. The farm questions and the race questions are not far apart.

Giving the negro the status of a white laborer was not a kindness that he could appreciate, having no natural inclination to continuous exertion or social responsibility. A native man in West Africa works hard for three or four weeks in the farm-cutting season, and during the remainder of the year is largely a gentleman of leisure, leaving the other work to the women. That negroes should be willing to work all the time like white men is not reasonably to be expected. It is a discipline for which their racial habits have not prepared them. The reaction against labor by negroes who can avoid it is entirely natural.

Anthony Trollope wrote of Jamaica in 1859: "The negro's idea of emancipation was and is emancipation not from slavery but from work. To lie in the sun and eat breadfruit and yams is his idea of being free. Such freedom as that has not been intended for man in this world; and I say that Jamaica, as it now exists, is still under a devil's ordinance". But the different races are not to be viewed justly from the same standpoint, as General Smuts now pleads:

African Race Characters

What is wanted in Africa today is a wise far-sighted native policy. If we could evolve and pursue a policy which will promote the cause of civilization in Africa without injustice to the African, without injury to what is typical and specific in the African, we shall be rendering a great service to the cause of humanity. For there is much that is good in the African and which ought to be preserved and developed. The negro and the Negroid Bantu form a distinct human type which the world would be poorer without. Here in this vast continent with its wide geographical variety and its immense climatic differences this unique human type has been fixing itself for thousands of years. It is even possible, so some anthropologists hold, that this was the original mother-type of the human race and that Africa holds the cradle of mankind. But whether this is so or not, at any rate here we have the vast results of time, which we should conserve and develop with the same high respect which we feel towards all great natural facts. This type has some wonderful characteristics. It has largely remained a child type, with a child psychology and outlook. A child-like human cannot be a bad human, for are we not in high spiritual matters bidden to be like unto little children? Perhaps as a direct result of this temperament the African is the only happy human I have come across. No other race is so easily satisfied, so good-tempered, so care-free. If this had not been the case, it could scarcely have survived the intolerable evils which have weighed on it like a nightmare through the ages. A race which could survive the immemorial practice of the witch doctor and the slave trader and preserve its inherent simplicity and sweetness of disposition must have some very fine moral qualities. The African easily forgets past troubles and does not anticipate future troubles. This happy-go-lucky disposition is a great asset, but it has also its drawbacks. There is no inward incentive to improvement, there is no persistent effort in construction, and there is complete absorption in the present, its joys and sorrows. Women, wine, and song in their African forms remain the great consolation of life. No indigenous religion has been evolved, no literature, no art since the magnificent promise of the cave-men and the South African petroglyphist, no architecture since Zimbabwe (if that is African). Enough for the African the simple joys of village life, the dance, the tom-tom, the continual excitement of fighting which causes little bloodshed. They can stand any amount of physical hardship and suffering, but when deprived of these simple enjoyments, they droop, sicken and die. Travellers tell how for weeks they would move impassive in horrid slave gangs; but when they passed a village and heard the pleasant noises of children, the song and dance, they would suddenly collapse and die, as if of a broken heart. These children of nature have not the inner toughness and persistence of the European, not those social and moral incentives to progress which have built up European civilization in a comparatively short period. But they have a temperament which suits mother Africa, and which brings out the simple joys of life and deadens its pain, such as no other race possesses. (Smuts, *l. c.* p. xi).

Variation renders the race characters more difficult to formulate, but differences are not in that account less real. For the race as a whole, these generalizations may not be unfair, but many individual negroes have abilities and virtues beyond this range. The irresponsible, happy-go-lucky disposition is not universal. Temperamental diversities of negroes may be as wide as ours. It often is not true that the negro feels no inward incentive to improvement, or that he is incapable of sustained effort. The sense of personal importance, the desire "to be somebody", often is more developed than in the white race, and out of proportion to ability, so that failure and brooding disappointment may result. The instinctive self-assertions of rough negroes are beyond civilized repressions. As an eminent negro told me many years ago, "Our people will not be satisfied until they can ride on the palace cars and spit on the seats".

In being strongly attracted to the white race, negroes are unlike the American Indians and other primitive peoples. The ready and faithful acceptance of the white man, gives the negro his power over us, and makes him the danger that he is. His special fondness destroys us, if not resisted. That another race can minister to our vices is our own fault, for us to correct in ourselves, instead of blaming the negroes for being deficient by our standards.

The idea of a mutual antipathy of races, as a primitive prejudice which fair-minded people must try to overcome, is false and superficial. The race tensions are generated after the original reactions are perverted, and the color-line defense of the white race then appears necessary. Cases occur in the South of real friendship, respect and consideration between members of the two races, and possibly would be more frequent if "prejudice" did not exist, but every intelligent negro knows distinctions among his own people as definite as the race lines, and serving like purposes of protection.

Artificial demands for "social equality" are prompted by foolish white friends who make matters worse by bringing the wrong negroes to the front. The really intelligent and cultivated negroes are polite and considerate, with no desire to go where they are not wanted, or to be patronized by the over-zealous whites who consider it their duty to associate with negroes.

Spreading the African Race

The present solicitude for preserving the African may be as gratuitous as the effort in the last century to make him over in our own image. Instead of being displaced readily by other races, he thrives better on the fringe of civilization than if left entirely to himself, like the trumpet-tree of the tropics, which occupies all the abandoned clearings. Much of Africa is sparsely populated in comparison with other areas more recently occupied by negroes. Covering the world with human weeds may be the sequel of our present civilization. The meek and inert may inherit the earth by outlasting the active and aggressive. Several intrusive civilizations in Africa have been obliterated, and the same tendencies are shown elsewhere. The British colonies in tropical America practically have been abandoned to the negroes, and much of the Latin countries.

Many negro districts in our Southern States undoubtedly have gone backward in the last century. White populations were largely displaced by negroes during slavery, and such movements have continued since the Civil War. Withdrawal of white farmers from the "black belts" is a tendency which eventually may make the United States a negro country, as a recent German writer has pointed out. Bell's law of racial deterioration applies also as between races. Removal of the more capable elements of a population tends to a more rapid increase of the less capable, as prudence and self-restraint have less meaning.

Racial Responsibilities

The Smuts enumeration of race characters apparently does not include any of the ingredients that would seem to be necessary for developing or maintaining the proposed new civilization, which is to be "distinctly African". Civilizations are not made to order but have to grow out of the abilities of races. Our European or "Western" civilization is only now reaching the stage of consciousness, where it can begin to take thought of its own racial interests. Making a new and superior race out of the African may be a worthy object, but how much confidence can be felt in the sincerity of such professions?

A Southern writer asks the searching question, "Does the South desire the welfare of the negro?" and the same may be asked of South Africa. The welfare of individual negroes undoubtedly is desired, but not negro welfare as an undertaking of race equality and assimilation. "At no cost is the South willing to jeopard the integrity of white civilization". Giving the negroes more consideration than the whites will not release the tensions, but only ripen "the bitter fruit of a graver racial problem".

Apparently the issue turns on the assumed obligation to develop other races. Is there a true sanction of such responsibility, or only a confusion of thought? What real connection can be seen between classifying humanity into racial groups and applying principles of justice? How many races or tribes are to receive this elaborate consideration and development of their special characteristics. In comparison with such a responsibility, the missionary effort to convert all alike into white Christians was a simple undertaking. Many separate questions are confused in the usual arguments on race justice and race equality. Instead of learning the race differences, we have been persuaded to deny and disregard them.

Even such a disaster as the civil war did not teach us that facts must be determined as the only escape from conflicting opinions. Prejudice grows and genders strife, for lack of mutual knowledge. The North was ignorant of the negro, while the South was unconscious of the effects of slavery, so that neither could understand the other, though both were sure of being right. High sentiments of patriotism were invoked on both sides, but fanaticism and rancor were indulged, in the absence of constructive leadership. A million young men, "the flower of the nation", were sacrificed, but the race problem remained essentially the same. Slavery was a blight on the white race, as many knew in the South, but the North became obsessed with the wrongs of the negroes, and "forgot that there were white people in the South". It was plain from the Southern standpoint that the free negroes and colored people would raise difficult questions, as the North at length is becoming aware. Education and the ballot were to place the African race on a footing of equality in the South, but the educated negroes are now seeking better opportunities in the North, and the race tensions are becoming nation-wide. For a subject that has aroused so much controversy and antagonism a special need of study may be claimed. "In a well-ordered state, even the right must not be brought about in a wrong way".

Effects of Parasitism

That the primitive races should be needlessly debauched and mongrelized, merely because the national divisions of the European race are indulging themselves in a struggle of industrial and commercial competition, is a commentary on our present civilization. The low-plane commercial contacts with the tropical countries, which disorganize and destroy the natives, certainly are no real advantage to the European race, even from the standpoint of furnishing markets for industrial products. Africa suffers from commercial and political aberrations, no less than from missionary zeal. The over-developed commercialism of our European civilization is a racial liability, instead of an asset.

The better we appreciate our own race, the less we shall wish to exploit the other races, and the more interest we shall take in their varied characteristics. The human diversity, as General Smuts points out, is one of "the great natural facts", which future generations would not thank us for destroying. Reducing humanity to a general mixture would solve the race problems, but by destroying the races, and certainly the life of the world would not be enriched.

The race differences undoubtedly are of the same nature as those that distinguish natural species or varieties and need to be studied and interpreted like other biological facts, before being disturbed or destroyed. Each tribe or separate group of people works out its own solutions of the problems of life, and some of these are of general value. Domestications of plants and animals, and the uses of important natural products, including rubber, quinine, cocaine and ephedrine, were discoveries of primitive peoples. Most of the arts and accomplishments of civilization were not original developments of our Northern races; but came as borrowings from other races. Is our civilization to find better courses of continued development or follow the same courses that have brought the civilizations of other races to destruction?

If we learned to live worthily in the new lands that we occupy, our relations with native races would be more constructive. Except for parasitism, the interests of the races are not necessarily in conflict. It is a false notion of civilization, that it can be sustained by parasitism. "Labor, unhonored by a patrician race, becomes dishonorable when identified with slave labor. Thus industry is sapped at the very root, and all progress is paralyzed". Parasitism is a social and economic error which tends to pervert and destroy civilization. Labor is an indispensable discipline of human development, as necessary for intelligence as for bodily strength and dexterity. The mind grows with the use of the hands. Laborers tend to improve while parasites tend to decline, and selection works against them. "Labor is liberty", to be appreciated and enjoyed. The great eugenic emancipation of the white race will come when we can free ourselves from the delusions of parasitism.

O. F. COOK

Origin of the Term "Tuckapaw" Cattle

The word used in connection with my article on "'Duck-Legged' Cattle in Texas" in the February number of this Journal (Pp. 84-90), and pronounced as if it were spelled "Tuckapaw" originated as follows: The word is correctly spelled "Atakapa" which was a name given to the Indians of the gulf coastal region of Louisiana and of Texas. The initial letter is seldom if ever pronounced. While this name was originally given to the Indians of the coastal region it was applied finally to the prairie lands of Louisiana and the cattlemen pronounced the name as indicated by the spelling used in the original article on "Duck-legged Cattle." For this information I am indebted to L. S. Frierson, Shreveport, Louisiana.

JAY L. LUSH

Iowa State College, Ames, Iowa.

powerful influence of the ancient church is very manifest in Holy Week and at Easter—the culmination of the church year. Through its female devotees the church rules the nation. There are devout men, but as a rule they are indifferent and at times hostile. The priests are daily the butt of their jests and criticisms as they glide along the narrow streets, wearing broad-brimmed hats, and with shaven heads and bare, sandalled feet; or as from the swallow-nest pulpits they hurl invectives at heretics and commend the faithful.

Though unpopular for a time as being the religion of her conquerors, the Roman Church yet retains her hold on Cuba This ancient and cunningly devised system is potent, partly through the influence of heredity. It appeals also to the Latin's love of the spectacular and the sensuous. Enshrined in mystery, appealing to the motive of fear, stilling argument and reason, the Church of Rome convinces her devotees that she has the keys of heaven and is infallible. But a new day is dawning. Holy Week and Easter observances that are rational and Biblical are being introduced by the Evangelical churches, which now number about fourteen thousand members. A host of Cuba's loyal sons and daughters have been taught a purer faith and a better way of keeping Holy Week; and their holy weeks of consecration to Christ number fifty-two yearly.

Many Protestant churches hold daily services during Holy Week, devoted to prayer, praise, Bible study, and review of the events connected with the passion and resurrection of our common Lord. The new gospel leaven is at work and vain practices are being bettered. We anticipate the time when, as a result of the diffusion of a knowledge of the truth, Protestant and Catholic will unite to make holier the Holy Week, standing together as brothers beside the vacant tomb, worshiping in union the risen, ascended, and glorified One who still prays that His people may be one.

Southern Workman - April 1909

INDUSTRIES OF THE AFRICAN NEGROES

FRANZ BOAS [1]

OUR judgment of the abilities of the black race is determined by our knowledge of the Negro in North America; and the principal fact that impresses itself upon our minds is the backwardness, inertia, and lack of initiative, of the great masses in the South, which cannot be outweighed by the achievements of exceptional individuals but by the slow but steady progress of the race as a whole. In our general impression we are not inclined to lay much stress upon the evil influences connected with the removal of the Negro from Africa to the shores of our continent.

1 Professor of Anthropology in Columbia University

A Sample of African Weaving

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African Milk Baskets

observed in our country can show what the capacities of the race may be in other surroundings; a broader treatment of the question will require a consideration of the achievements of the Negro under other conditions, and particularly of the culture that he has developed in his own natural surroundings. The conditions for gaining a clear insight into this question are particularly unfavorable in North America,

Pottery Made by the Bali Tribe

where loss of continuity of development and an inferior social position have made a deep impress on the race that will be slow to disappear.

Examples might be adduced from many parts of the world, and relating to many races, which show that a people that has been held in subjection for a long time, and the mental horizon of which is limited by the narrowness of the work that it has had to perform,

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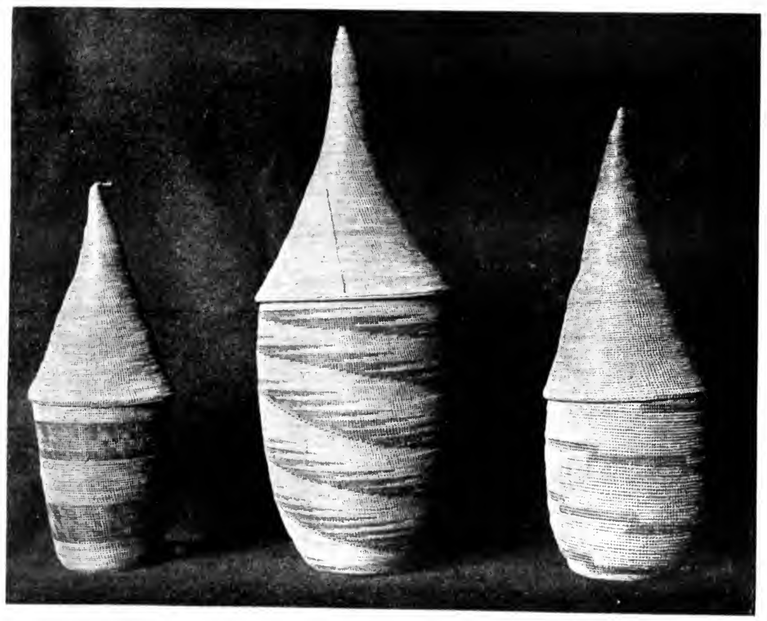

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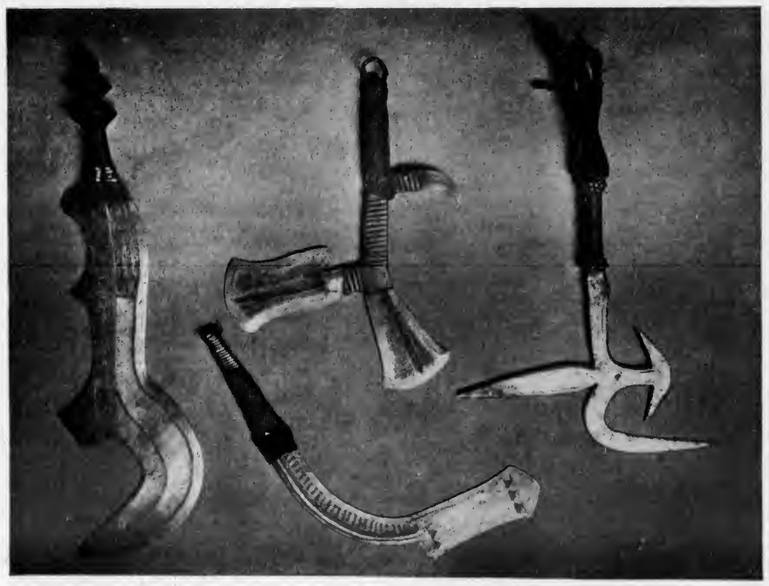
Mistake of Preceding Frame

Wood Carving from the Congo Basin

becomes dulled, and requires time and a powerful mental stimulus to achieve material progress. The European peasantry, during the period of servitude, is a striking example of this kind.

To the unfavorable conditions among our American Negroes which are due to slavery has been added the detrimental effect of the break with their historic past, the importance of which has hardly been sufficiently recognized. The Negro, when taken by force from the shores of Africa, left behind the whole social and economic surroundings in which he had grown up, and upon his introduction into



Congo Throwing-knives

Carved Stand for a Bow (Congo)

America found himself in a culture fundamentally different from his own, with which his previous training had practically no contact, and in which he has always remained an outsider whose presence is suffered, but who remains excluded from those advantages of our civilization which become manifest only in the intimate social intercourse of equals.

This loss of connection with the historic past is without doubt one of the most degrading influences in human culture. Its effect may be seen wherever the civilization of Europe comes into contact with the cultures of primitive man. Native industries and native art disappear with incredible rapidity wherever the European and American trader steps. This is largely due to the fact that an hour or two of service makes it possible to acquire efficient tools and utensils, which are only too willingly substituted for the less effective though artistic products of native industry, which it may require days or months to make. Owing to the ease with which cheap foreign goods are acquired, the whole basis of the economic life of primitive peoples breaks down. There is no new occupation to fill the mind during the hours which were formerly devoted to artistic and industrial work. With this moment dissipation sets in, which is fostered by the disregard of native law by the European invaders; and thus the whole social fabric, the beliefs, and the sacred customs of the people, are lost in

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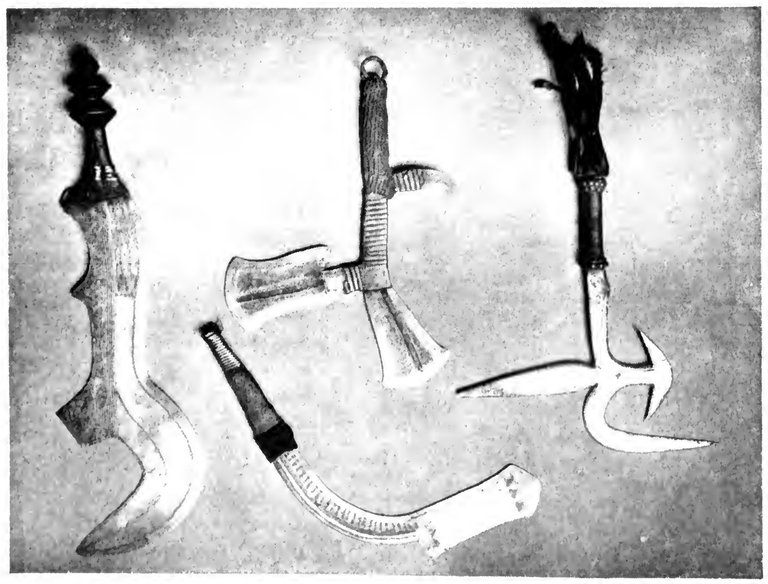

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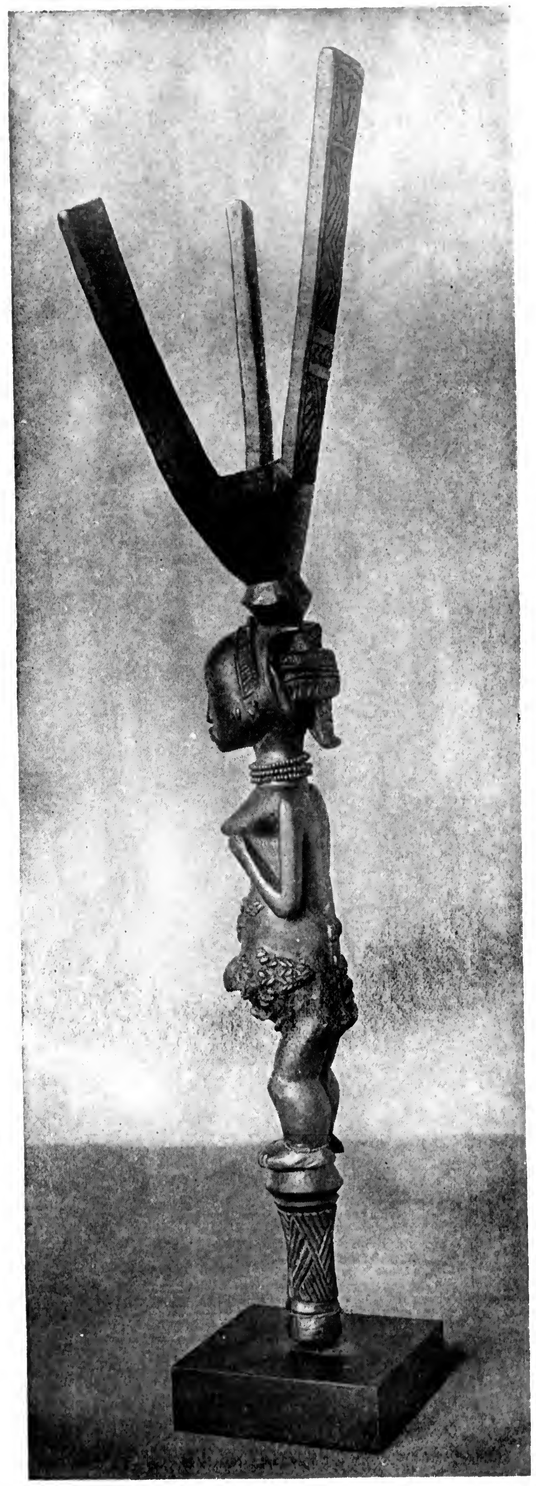

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In these respects the American slaves were in a condition similar to that of tribes now disintegrating under European influence. Their former activities disappeared, and a new kind of work was forced upon them that had no relation to their inner life. The pleasure

Ceremonial Axes from the Upper Lomami

of work was lost, for it can originate only where social needs offer a sufficient stimulus to arduous and patient labor, and where the work achieved gives satisfaction because it is in harmony with the inner needs; and the substitution of new ideas had not taken place.

What influence contact with the whites has had upon the industries of the African race may be seen by a study of native African products. It is hardly possible to conceive a greater contrast than that between the natives in those parts of Africa that have not become subject to the degrading influence of European imports, and

the uneducated masses of Negroes as we know them in America. Those qualities which are commonly considered as the objectionable traits of Negro character seem to be entirely absent, and replaced by others which we are now endeavoring to instill into the race through the agency of industrial and other schools. Here we complain of indolence, a happy-go-lucky reliance upon the next day, unrestricted emotionalism, and a general lack of will-power, as characteristic

Axes from Lake Tanganyika

Negro traits. In aboriginal Africa the village life is replete with activity. The extensive gardens of the village must be tilled: the loom is busy; in the hands of the women plastic clay is made into useful pottery ware; the wood-carver makes dishes and other useful articles for the home and adorns them with fanciful carvings; the blacksmith's bellows are busy and his hammer may be heard. The produce of the fields and the work of the artisan are packed up and

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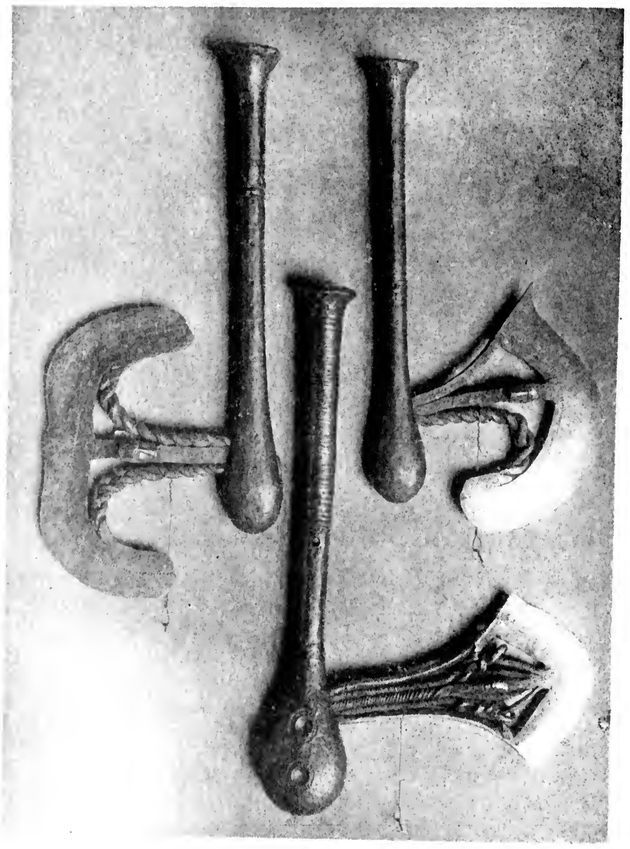

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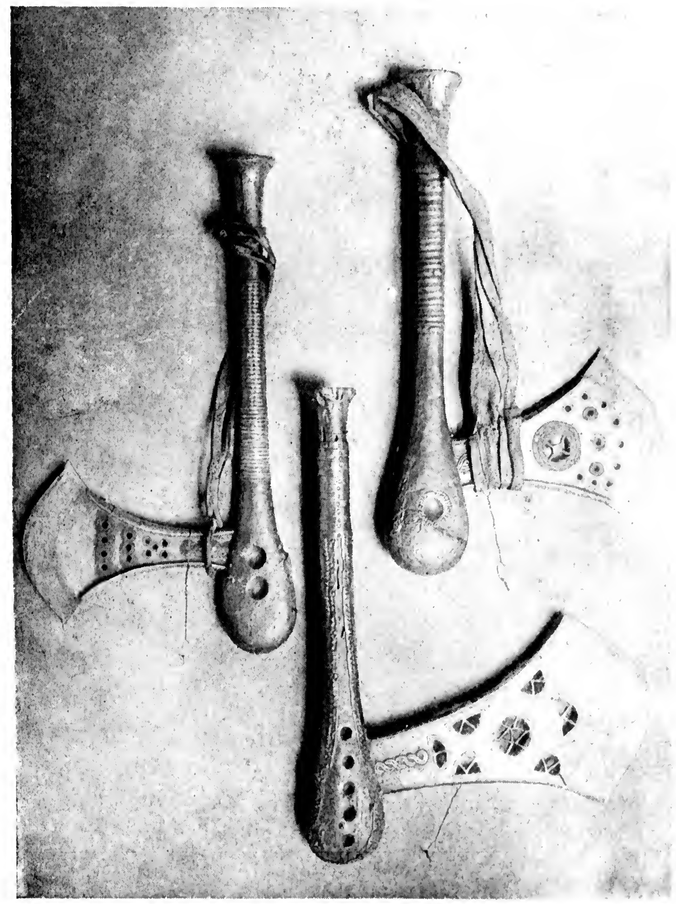

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Native African Jewelry

an issue before a formal court of justice; and the chief and his officers attend not only to internal affairs, but also to those relating to the tribe and its neighbors. These sometimes reach a considerable magnitude. All over Africa, travelers and investigators have given reports of men of great ambition, power of organization, and force of character, who have succeeded in welding together, from tribes and fragments of tribes, empires that rival in magnitude the large states

of Europe, and the organization of which is so firmly established and so well protected by military and political devices that some of them have endured for many generations. Examples of such empires might be given from South Africa, where the Zulus as well as the Hottentots have produced great rulers. They are found also in the region south of the Congo where the empire of Lunda attained at one time an enormous size. At the time of the discovery of Western Africa they existed near the mouth of the Congo, and we know about them as early as the eighth century in the region of the Niger.

The industries of the Negroes, which require much of their time and attention, are not by any means carried on in a rude manner, with the endeavor to manage with the least possible amount of labor; but in the regions uncontaminated by the whites the product of native art is remarkable on account of its great beauty and excellence. Unfortunately our American museums have never paid any adequate attention to this subject, although we ought to recognize that a knowledge of the African at home would help us materially in the solution of our Negro problem.

Excellence of work and artistic merit characterize the work of the women as well as of the men, and may be found in all parts of Africa. We have selected here a number of illustrations from specimens contained in European museums.[1] These were made partly by natives of the coast, near the mouth of the Niger and farther to the west, one of the districts from which a large portion of our slave population was derived. Others were obtained in the Congo basin, among a people closely related to the coast tribes of the same district, which has also furnished many of our slaves. There is no doubt that the culture that is found now in the interior is in many respects similar to the culture that prevailed at the time of the discovery on the coast, which, however, has largely disappeared, owing to the destructive influence of contact with Europe and America.

Among the house furnishings of the Negroes, baskets take an important position. They are not only employed to hold utensils and provisions for everyday use, but they are also extensively used in carrying material about from one place to another, and for keeping grain and even liquids. The styles of basketry found in Africa are varied, but almost everywhere excel in beauty of form and decorative design. Some baskets are made of wicker-work, simple in design, but of such regular execution that the technique itself lends charm to the finished object. Of particular beauty are the high milk-baskets with their high conical covers, from the region north of Lake Tanganyika. These are made in a very close stitch and are perfectly water-tight. They are not only of great regularity of form and smoothness of curve, but their decoration, which is executed in dyed materials, adds

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1 I wish to express my thanks to my friend, Professor Felix von Luschan, Director of the African and South Pacific Collections of the Royal Ethnographical Museum of Berlin, for permission to have an extensive series of photographs made, illustrating native African art.

to their beauty, and makes them comparable to the baskets made by the Californian Indians, which are nowadays so highly prized by collectors. The cleverness with which technical designs and dyeing are used jointly for the production of decorative effects is particularly characteristic of African basketry.

Not less beautiful are many of the mats, which reach a particularly high development in the region near the mouth of the Congo. In many of these the designs are exceedingly complicated and of great beauty. The favorite pattern which is applied in these mats is an imitation of the interweaving of large wide bands, each being decorated with a peculiar design; but angular representations of animal figures also occur quite often. Mats from this region that do not show any kind of decoration are very rare.

In Africa pottery does not attain as remarkable a development as it has reached in some of the other continents; but still there are many regions in which beautiful forms have been produced, and where a great deal of artistic imagination is employed in the manufacture of pottery designs. This is particularly true of parts of the region near the mouth of the Niger, where the Bali are renowned for the excellence of their pottery. Three jars made by this tribe are shown in the illustration. The largest one, in the middle, is remarkably regular in form; the ornament of its upper part seems to be an imitation of a covering made of basketry. The smaller jar to the left, with its longer neck, its ornamental handle, and the small peculiar knob on the opposite side, is also of considerable æsthetic value, and conveys at once the impression that the present form and its ornament must be the result of older forms, in which basketry, clay, and perhaps also the gourd, were used. In the same region small vessels of exceedingly complicated form occur, a few of which are shown. The boldness with which the clay is handled in the foot of the vessel is truly remarkable. Those who are familiar with the history of primitive art will readily recognize that vessels of this form also are not spontaneous inventions, but the result of long historical development. Curiously shaped pipes, representing human heads and fantastic decorative motives, occur here also.

African art finds perhaps its highest development in wood carving and in iron work, and of these a number of examples are here given. It has been pointed out before that on some of the clay vessels and on mattings, woven bands are one of the favorite motives represented. The same element occurs in the geometrical decoration of four cups, which are carved of hard black wood. While in the two middle ones the execution lacks somewhat in accuracy and the lines are irregular, the cup shown on the left exhibits high technical skill. The design itself, although peculiar, shows a beautiful combination of fret patterns, presumably derived from woven designs. The fields are contrasted with great skill by different treatment of the surface,

the dividing lines being left smooth, while the square fields are subdivided by window patterns, the intervening bands being treated by hachure. The cup to the right is closely related in its decoration to the one on the left, but its form is further developed by the addition of a well-carved base. These cups, which are made for daily use, were obtained from one of the tribes of the Congo basin.

Bold carvings in the round are executed in great number and with great individuality by the Negroes of the Congo region. We have selected for illustration a stand for a bow, which is supported by a carving representing a human figure with very well-executed and strongly individualized face and headdress, the body of which shows the characteristic scar designs which are used by the Negroes in place of tattooing, each tribe having its own peculiar design. For this reason scars are represented in somewhat exaggerated size, in order to bring out the design with perfect clearness.

Even more meritorious than the wood carving of the Negro is his metal work. The art of reducing ore and smelting iron is known practically all over the African continent, with the exception of its most southern part. It seems even likely that the art of making iron implements may have been first invented on the African continent by the Negro race; but, however this may be, there is no doubt of the fact that no primitive tribe in the world has reached as high a development in this industry as the African Negroes. Everywhere the blades of lances, large knives, and large arrows, are characterized by great symmetry of form and most careful workmanship; but hammered iron work probably reaches its highest development in the Congo basin. A few forms of knives, strongly individualized, and characterized by great regularity of form, from some of the southern tributaries of the Congo, are shown in the illustration.

The most complicated forms are found in the throwing-knives and decapitating-knives that are used by the natives of the Congo and its northern tributaries. The throwing-knives are used in war, and are sent forth with a swirling motion. They have numerous sharp blades and points, so that, no matter how they may hit the victim, they will cause dangerous wounds. In principle almost all these forms may be reduced to the same type, consisting of two large blades and a spur. The handle is either made of wood or covered with a netting. Related to these forms are also the large decapitating-knives which show beautiful curves, and the surfaces of which are often decorated with incised lines in various arrangements.

A still higher advancement of the art of the smith is found on the upper Lomami, where ceremonial iron axes occur, the blades of which are made of iron work consisting partly of stout, twisted iron wire, and partly of a bar which often shows a human face as decoration. Three of these may be seen in the illustration. The art with which the twisted wire is attached to the blade, and the sharply-cut lines of

the human face on the middle part of the axe-blade, deserve special attention. The wire work in the axe shown on top is particularly complicated. In judging of the value of these products, we must remember that the tools which are used for their manufacture are exceedingly simple, consisting generally of a pair of hand-bellows, a stone which serves as an anvil, either a stone or a heavy piece of iron as a hammer, and a pair of wooden or iron tongs. Another type of axes from the same region, not far from Lake Tanganyika, has broad blades, and is decorated with perforations filled with coarse filigree. The perforations are generally also decorated with etched designs, which are further brought out by being filled with copper wire hammered into the etched lines. The handles of these axes are generally made of wood overlaid with thin hammered copper. Knives with ivory or wooden handles are made in the same manner.

Not only have the African Negroes developed the art of hammering iron, but the art of casting has also reached a high stage of development, particularly among the tribes in the region between the Niger and the slave coast. Small castings from this area have been known for a long time; but a true insight into the artistic and technical merits of the art was obtained only a few years ago, when the English expedition against Benin destroyed that city, and when the beautiful bronze castings and ivory carvings that surrounded the king's palace became known to the civilized world. The technical execution of these castings is so perfect that it would require the skill of our best bronze casters to do work of the same boldness. In their relief plates the figures stand out high above the background; and the fineness of the connections and the intricacies of the design are such that it must have been exceedingly difficult to make the metal run smoothly through the whole form. The artistic merit of the castings is very great. The vividness with which scenes in the life of the people—their war expeditions, and their occupations—are rendered, the truthfulness of the details of costume and of expression, are a revelation to those unfamiliar with the merits of Negro art. On the Benin casts occur a considerable number of representations of Portuguese soldiers, which allow us to fix their date with considerable approximation. Presumably most of them were made during the sixteenth century; but the perfection of the art and the wider distribution of its more degenerate forms all along the Guinea coast, prove that it must have been the result of a long development; that it was the product of a flourishing technical and artistic school which well deserves the attention of the student of human civilization. Descended from this art are the castings of brass which are now commonly found on the Guinea coast, partly used for personal ornament, partly as weights and measures, and which also serve ceremonial ends. There is little doubt that the forms of these castings are closely related to the forms of some of the wood carvings which

would tell a different story. It is surely wrong to say that all recent American students reject correlation of kinship terms with *any* form of social procedure (182); whatever criticism may be justly leveled at extremists, some correlations are among the most certain results not only of anthropology but of all science and logic. Finally, the omission of Von Hornbostel's name in the reference to primitive music (278) seems curious.

One of the most attractive features of the book is undoubtedly the abundant use of material quoted from field reports. Dr. Wissler, it is clear, strongly felt that this was an appropriate, as it is the only possible, compensation for lack of field experience.

The book undoubtedly requires a good deal of supplementary activity on the part of the instructor. But with such cooperation it certainly can become an effective instrument for vindicating the ways of anthropology to a wider circle. Last summer I used it with precisely the type of students for which it was designed and felt at the close of the term that they had gained some conception of the major problems of anthropology and of some of the achievements made in the objective study of group phenomena.

ROBERT H. LOWIE

Outlines of Sociology. JOHN LEWIS GILLIN and FRANK W. BLACKMAR. (New York; Macmillan, 1930. 3rd ed., x+692 pp. $3.00.)

This is a very thoroughly revised and re-written edition of a college text which first appeared in 1915, and won wide favor. The first mentioned author appears to be responsible for the revision, although no statement to that effect appears. There is a treatment of social evolution and primitive society and primitive belief. Here, as in several other recent texts in sociology, one finds acquaintance with and references to the work of Goldenweiser, Lowie, Kroeber, Jenks, Wissler, Tozzer, and other American anthropologists. A chapter on culture has been introduced into this volume, but, curiously, there is no reference to the contributions made by other sociologists in this field (notably, Ogburn and Willey). Unlike most texts, there are numerous footnote references to authors and sources. The selected bibliography at the end of the volume does not appear to have been as thoroughly revised and modernized as has the treatment of chapter topics. The style is direct and easy, the exposition excellent. Each new moon sees a new sociology text come from the press of this country, and there must be enough now to sink a dreadnought. But there should be ample room on some new vessel for a text of the high merit of this one.

WILSON D. WALLIS

AFRICA

Races of Africa. C. G. SELIGMAN. (London: Thornton Butterworth, Ltd., Home University Library, 1930. 256 pp., 3 maps.)

This is a welcome volume, especially in view of the dearth of compendious works dealing with Africa as a whole in English. It is done with the authority

primitive, but in artistic singing, may thus apply as much to the surrounding intervals as to the one under discussion, and either of the surrounding intervals, in its own nature, may affect the rendition of the one in question. The pitch may be influenced, much as stellar bodies are pulled in space by the presence of other bodies, by the general direction of the melody and the prominence of certain of its tones, or by a tendency on the part of the singer to attenuate or actuate melodic curves.[1]

H. H. ROBERTS

An Introduction to Social Anthropology. CLARK WISSLER. (New York: Henry Holt & Co., 1929. X, 392 pp.)

A cursory inspection of Dr. Wissler's latest book might suggest that it is a work of the order of Tylor's Anthropology, the chapter headings indicating such topics as "The Economic Base," "Marriage," "Animism," "Magic," etc. Actually, the author's purpose, as explicitly set forth in the Preface, is a quite different one. He has written a text for students of the social sciences not specializing in anthropology but eager to acquire "a minimum of descriptive data and as comprehensive an interpretative view as time permits." Dr. Wissler solves his problem by "presenting the research leads of anthropology in their historical sequences."

Accordingly, the chapter on "The Tribe" begins with references to Morgan, Maine, Bachofen, and McLennan; "Relationship Systems" with Morgan; "Mythology" with the Grimm brothers, Max Müller, Kuhn, and Brinton. Naturally no two anthropologists would agree as to either the topics that should be stressed or as to the comparative importance of "research leads." Personally I am not prejudiced against the study of kinship terms, but I consider it odd that a whole chapter should be devoted to it. On the other hand, the the slighting of technology and the omission of art seem inexplicable in view of the important results achieved by the ethnographic approach and Dr. Wissler's own contributions to these departments of our science.

In the judgments on specific points of anthropological fact and theory there are naturally some that provoke dissent. To the reviewer the exclusive emphasis on *primitive* culture in the initial definition of anthropological aims seems exaggerated (14 ff., 55), being logically unwarrantable and even practically impossible at times. In setting the upper population limit of the political primitive at 2,000 souls (36) Dr. Wissler evidently forgets dozens of African cases. In the South Seas—contrary to a statement restricting the culinary art to women (59, 156)—men are known to prepare meals quite regularly. Unless my authorities have been superseded, rye and oats do not date back to the Neolithic in Europe (69). I think it is unfair to say that anthropologists are not interested in political organization (130). The dearth of relevant material for America owing to changed modern conditions seems to have misled the author here; the Polynesian and African data

[1] H. H. Roberts, Variation in Melodic Rendition as an Indicator of Emotion. Psychological Review, 34: 463–471, 1927.

and conservatism expectable of Professor Seligman: it is marked by balance and plays no hobbies. The allotment of space is: Introduction, 15 pages; Bushmen, Hottentots, Negritos, 28; True Negro, 44; Eastern Hamites, 32; Northern, 29; Half-Hamites and Nilotes, 24; Bantu, 52; Semites, 16. All the more important peoples are mentioned and classified, and wherever data are available, the physical type is indicated and the culture compactly outlined. This plan scarcely makes for intrinsic readability, but renders the work one of convenient reference for orientation. The three sketch maps serve their purpose admirably, but an additional one showing the approximate situation of the principal tribes would have helped. One has not always the map at hand with which Professor Seligman says the book is intended to be read, and a localization like "eastern Kenya" is likely to be as vague in many visual imaginations as "western Minnesota" would be to most Europeans. There is no discussion of and scarcely any allusion to the Egyptian-diffusionist, Kulturkreis, or analogous hypotheses; but views like those which derive the Hamites from Asia and the Bantu from the lake region are approved as tentatively probable.

The book is different in emphasis of objective from any comparable one that might be produced in America. The first question always implicit is, Where did this people come from and what are its origins? This puts race and culture on the same plane and interweaves their consideration, where Americanists tend to separate them as much as possible. Culture as such is treated as it occurs among single people or groups of tribes, never as regards the wider distribution of its parts or aspects. Thus age-grading in east Africa would by us be treated as undoubtedly a single development, and attempts might be made to trace its source, spread, and relations to other facets of the cultures in which it occurred. Professor Seligman describes the institution separately, and without further comment, for the Galla (122), Masai (164), Akamba (221), because these are respectively Hamites, Half-Hamites, and Bantu. In short, the primary consideration is not cultures but the peoples that carry cultures—as the title Races of Africa correctly indicates. Brinton's American Race, now nearly 40 years old, is the last American counterpart. Naturally, anything like a culture area approach is out of the question. These remarks are made not in criticism, but in order to elucidate the aim and treatment of the book and to emphasize how heterogeneous—perhaps happily so—anthropology still is.

A. L. KROEBER

At the outset Dr. Seligman is aware of the difficulty under which he approaches his task of presenting an account of the races of Africa in the short compass of a volume of the Home University Library. This however, is not the most formidable of the obstacles. This is not a series which allows photographic illustrations, and there can be no doubt that clear presentation of a popular kind is almost impossible without some pictorial aid.

In reviewing a book, judgment must be made with regard to the subject matter and arrangement in relation to the public for whom the book is intended. Volumes

of the Home University Library are, I believe, intended for the general reader whose interest is due to a desire for a brief outline of many branches of knowledge. The Races of Africa is a book which will be of great service to students of anthropology; moreover it slips easily into the pocket, and is one which I should like to carry into the African field. This small volume contains a vast amount of accurate information, much of it from the author's well known personal research in Africa, and the rest from well accredited sources. To a university lecturer who is giving outline courses on the ethnology of Africa the book will prove a valuable aid.

I am nevertheless doubtful whether the general reader, actuated by no interest other than that of improving his general knowledge, will care to peruse the book carefully. Dr. Seligman has tried to make good the necessary absence of illustrations by very careful records of physical measurements, including cranial indices. In spite of the explanations, clearly given, I doubt whether the interest of the general reader will survive through the comparisons of figures of measurement.

Details respecting linguistic differences are clearly presented, but these, like physical measurements, are the aspects of the subject which are of the least interest to the general reader. Ethnology receives some attention but technology is neglected. I imagine that one who wishes to acquire an outline of the races of Africa is interested chiefly in occupations and culture patterns. As an ethnologist Dr. Seligman is over anxious that there shall be no misunderstanding, and no omission of points of scientific importance.

For the purpose of conveying an accurate though popular impression of the races of Africa I think the division of the continent into a few culture areas would have been of primary importance. Physical differences and linguistic divisions should have received a brief treatment, while the greater part of the book should have been devoted to pen pictures of types of life in the great natural zones. Had Dr. Seligman given a series of descriptions as realistic as his account of the life of the Kababish of Kordofan, the book would have had a well deserved popularity. The student must be grateful that Dr. Seligman decided to condense African ethnology rather than indulge in a bright and attractive presentation of modes of life.

WILFRID D. HAMBLY

Nuer-English Dictionary. RAY HUFFMAN. (Berlin: Dietrich Reimer [Ernst Vohsen], 1929. 63 pp.)

To the first fifty-three pages of dictionary in this little volume are added ten pages of grammatical notes. The work is entirely unpretentious and is not intended to be more than a preliminary introduction to the study of this African language. Nevertheless the work seems to be well done and the phonetic system used is clear and competent.

Nuer belongs to the Nilotic group of "Sudanese" languages and is thus related to such languages as Shilluk, Bongo, Dinka, and, further south, Masai, Nandi, and Latuka. Nuer does not seem to possess the gender system of Masai but it has a

Africa

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RECENT CONTRIBUTIONS TO THE ETHNOLOGY OF THE UPPER VOLTA AND THE IVORY COAST

Les Tribus du Rameau Lobi. H. LABOURET. (Vol. XV, Travaux et Memoires de l'Institut d'Ethnologie, 452 pp. 125 francs, Paris, 1931.)

Religion, Mœurs et Coutumes des Agnis de la Côte-D'Ivoire. L. TAUXIER. (254 pp. 75 francs, Paris, 1932.)

Djénné une Cité Soudanaise. C. MONTEIL. (301 pp. 60 francs, Paris, 1932.)

Each of these writers makes his contribution to the ethnology of French West Africa after long experience of administrative work among native tribes. H. Labouret states that his monograph on the Lobi and kindred tribes is the result of eleven years of personal inquiry, conducted for the main part directly in the native languages. Since the work describes the inhabitants of the Haute Volta the information is particularly valuable for comparative study with R. S. Rattray's Tribes of the Ashanti Hinterland. Moreover, Tauxier, in describing the culture of the Agnis, has aided the ethnologist in ignoring political boundaries in order to appreciate the homogeneities of culture existing in French and British territories, which are separated by a political demarcation dividing Ashanti from the Ivory Coast.

H. Labouret lays a foundation for his ethnological study by considering the physical features of the Upper Volta country, and in doing so he points out the influence of the river in establishing and perpetuating many local cults, including fertility rites associated with inundation and welfare of crops. In his general survey the author notes the presence of stone ruins, which, like similar structures found between Gambia and Nigeria, are of unknown origin; neither is a chronological sequence established.

A description of the inhabitants of the Upper Volta region, some of whom use the penis sheath and leaves, recalls sartorial customs which may be observed among the Angas and other tribes of the Bauchi plateau in eastern Nigeria. In physical appearance the Lobi are said to be like the Konkomba.

Demographic study, though brief, is welcome, since such observations are scanty in relation to the population of Africa as a whole. H. Labouret considers 457 conceptions, from which he makes a deduction of 87 cases of miscarriage and stillborn infants. The estimate of 8 per cent mortality during the two first years of childhood is almost incredibly low. The investigator concludes that 45 per cent of his sample died in the age period forty to fifty years.

In Book II, which is devoted to technique, industries, and sciences, the author rightly stresses the ritual element, especially in the working of iron and washing for alluvial gold. Outline sketches of tools greatly aid the technological details, and the account of strophanthus as an arrow poison is useful, for the author has done justice to the botanical and ritualistic factors.

Under the heading "Industries de Consommation" the preparations of grains, meat, fish and salt are described. Here there appears to be a reversal of the logical order of presentation, for, after describing the use of food products and methods

of cooking, information is given with regard to food gathering, hunting, fishing, cattle breeding and apiculture. The more natural arrangement would have been, first a description of the foods themselves and the methods of acquiring them, then the account of culinary operations.

The spiritual side of agrarian activites is emphasized in an account of the way in which heads of families consult ancestral spirits, and sacrifice to them before sowing grain. In addition to this there is offering of the first flour at the tomb of a father, or on an altar consecrated to him.

Book II is concluded with an account of medical lore, astronomical knowledge, time divisions, and counting, and in the following book an account is given of games, music, dancing, singing, plastic art and personal ornament.

The fourth book, La Société, examines governmental structure by working downward from the tribe and the clan to the family. A study of death and funeral rites concludes this section, and although it might be argued that beliefs connected with death and burial would be more effectively dealt with under "religion," inclusion of these data under a study of society enables the author to point out the connection between societal structure, kinship, and obligations connected with obsequies.

Preliminary observation indicates little social cohesion, but further investigation shows that individuals, far from being independent, are bound closely by mutual obligations. Inasmuch as the Lobi form a sedentary group speaking a common language they may be spoken of as a tribe. But they have no uniform system of government and administration, and they are not conscious of interests common to the whole tribe. There exists no general organization, council, or supreme chief, and subdivisions of the tribe are not capable of even a temporary concerted action.

The subject of clan organization, totemism, and exogamy, receives detailed treatment (pp. 222–242), and in this connection the functioning of joking-relationships between clans and individuals is of particular interest. This subject has been dealt with elsewhere by H. Labouret.[1] The relationship of structure and function, for example in warfare and sharing property, is admirably kept in view. The data adduced with regard to the present clan organization, respect for certain animals, and the operation of exogamy, would, I think, warrant a somewhat stronger assumption respecting the more complete functioning of these institutions before their decline began, for the facts do suggest disruption of a more complete organization.

The kinship system and its terms of relationship are only briefly considered, and the value of this section would have been enhanced by tables of relationship. The sisters of a mother are considered as "little mothers," and the maternal uncle has a close functional relationship with his sister's sons. When taking a second wife, a young man expects to receive the necessary bride price (earnest, or token money) from his mother's brother.

The data relating to childbirth bear directly on religious beliefs, for the Lobi believe in a scheme of reincarnation whereby souls of the dead enter into human

[1] La parenté à plaisanteries en Afrique occidentale, Africa 11: 244–293, 1929.

embryos. Boys are not circumcised, but an operation of excision is performed on girls in the belief that this facilitates childbirth, and sometimes a second and more drastic excision is performed to expedite delivery. According to locality the operation may be carried out on the fourth day after birth, during the period from seven to ten years, or a few weeks before marriage.

The contents of Book V, Les Conditions Economiques, raise the question of arrangement, and it is not clear why the chapter on social life should have been interpolated between two series of interrelated economic facts. The persistence of spiritual beliefs and their intrusion into secular matters is aptly illustrated by a description of founding a market, for which purpose a diviner consults ancestral spirits. An account of native and foreign merchandise together with a description of weights and measures is introduced at this point.

Under "Civil Law" the religious character of land tenure is described. An earth cult exists, and a divinity has to be addressed before new territory is chosen as a site for a village. There is a religious sanction to marriage, for the spouses are under the protection of a family deity, and they are expected to observe reciprocal fidelity under pain of arousing the anger of ancestral spirits. A study of the judiciary begins with an account of the authority of heads of families, and in dealing with public justice the procedure of trial by ordeal is described. The moral factors of truthfulness, generosity, hospitality, loyalty, and modesty are discussed.

The section on religion and magic (Book VII) would be profitably read in conjunction with Rattray's Religion and Art in Ashanti, for H. Labouret discusses the concept of a supreme being (Dieu-Atmosphere), powerful and remote, not concerned with the daily lives of men, but somewhat like the Bantu beliefs in Nyambi, Suku, and Kalunga. Yet the Lobi, like their Ashanti neighbors, have a hierarchy of spiritual beings who, because of their interest in the details of human life, demand placation. Deities of the river, also household gods, patrons of hunting, fecundity, and protectors against sorcery are described.

In discussing the difficulty of demarcating religion from magic the author points out that acts and beliefs associated with worship of supernatural beings are similar to certain rituals and spells, which are not connected with a person or a power. This book includes a study of concepts of spiritual counterparts of the body which have various fates after physical death, and again at this point the need for comparative study with similar beliefs of the Ashanti is evident, for one of the ultimate aims of anthropological study is the breaking down of ideas of separation engendered by the existence of political boundaries and the publication of separate monographs in different languages.

At the end of the book are thirty-one plates in photogravure, excellent in technique, but in a few instances, in order to show stages in a process, eight pictures appear on a page. Since each picture is only 4 cm. square the details are not instructive, and half the number of views would have been more effective. An adequate index is provided.

L. Tauxier, retired administrator of colonies, divides his work on the Agnis into two parts, "Les Agnis de l'Indenie" and "Les Agnis du Sanwi." Under the

former heading he treats of history, work, family, law, and religion. The second part includes a chapter entitled "Anthropologie" which is anthropometrical. Under the heading "Linguistique" the author gives four pages of comparative study of one hundred and twenty words from each of six tribes. From this chapter on linguistics an account of folklore is separated by a chapter on law and religion. Stories are grouped in three divisions according to their motives. Thus, there are tales having the spider as the main interest, stories centered in women, and a section of miscellaneous tales. The measurements made by the author, and the figures he adduces from other works for comparative study, will be of great interest to physical anthropologists. It is unusual to find among studies of African tribes measurements taken on a group of women. But L.Tauxier was able to record the measurements of sixty-eight men and fifty-two women of the Agnis.

A valuable part of the work is the report of interrogations made in court in connection with magical practices, for these inquiries, given as question and answer, throw considerable light on native thought processes and attitudes toward the supernatural.

Historical considerations tend toward monotony, for they are not used effectively to show how the complexity of events has affected the structure of institutions and the psychology of individuals and groups. In order to understand the present complexity of native thought, European intervention, and Mohammedan admixture, historical study is of paramount importance. But such research is effective only when the facts of history are treated, not merely statically and categorically, but as dynamic and determining elements of culture.

The method of approach is open to criticism. For instance, in the chapter on "Work and the Family" the author begins with several pages of statistics giving the export of coffee, cocoa, rubber, and palm-oil, in the period 1910–1923. Would it not be more natural to give all available information respecting native activities of an indigenous kind; then, in order to impress the reader with the consequences of European intervention and the result of diverting native labor into industrial channels, perhaps quote a few figures.

A good map is needed. Nineteen plates in photogravure are excellent in technique, but one is disappointed to find that only three of these plates are of ethnological value. The remaining plates, dealing for the main part with attractive scenery, are more suitable for a travel book. A reader will find the dearth of useful illustration particularly trying when attempting to follow the description of technological processes.

The book contains a great quantity of valuable ethnological information relating to a region by no means adequately described, and the volume will be exceedingly welcome to students of West Africa. But a critic is left with the desire to carry out some rearrangement of parts, to change the method of presenting data, to substitute more useful plates, to add some line drawings, and to provide an index, the usual place of which is occupied by a generous list of *errata*.

Djénné, a Sudanese city, situated between the River Niger and its affluent, the Bani, resembles Timbuctu, Kano, and Sokoto, in being a great emporium of trade

for many centuries, and therefore a focal point in the study of history and ethnology. C. Monteil, one-time colonial administrator, begins with a clear outline map and a survey of the topography and biology of the region, a very necessary prelude to the study of human life. His notes on the domestication of three types of guinea fowl are of peculiar interest, since this subject has received little attention, and references are few. My own acquaintance with the practice was made by shooting a brace of birds near a village in French Niger Territory, entering into an altercation, and paying an indemnity.

The principal grains are rice, sesame, and maize. Ground-nuts are important; cotton is grown, and the bark of the baobab is used for making cordage. Horses, cattle, sheep, goats, and donkeys are used, while dogs are slaughtered and eaten by non-Mohammedans. Pigeons have been introduced from Morocco. Apiculture is followed, and one species of domesticated duck is appreciated.

To follow the history of Djénné through all the intricacies of warfare, politics, and racial movements during eight centuries is a stupendous task, in which a reader will find himself aided by supplementing Monteil's account with a perusal of E. W. Bovill's "The Moorish Invasion of the Sudan" (Journal African Soc. XXVI, 1926, 245-262; 380-387) and H. R. Palmer's "Sudanese Memoirs." The "Haut-Sénégal-Niger" and other writings of M. Delafosse are also useful in this connection.

A brief summary of the physical features of several tribes is given, and points of ethnological interest relating to Peuls (Fulani), Bozo—a primitive fishing community, the Mali, the Nono, and the Songhai, are given. The presentation takes the form of brief notes rather than a coördinating study showing the interrelation and miscegenation of ethnological traits. The subject is, however, so complex that one volume would not suffice for analysis of this kind even if the facts were ascertainable. The account of the Bambara is so brief that a student will find it necessary to supplement the information by reference to the work of J. Henry (L'âme d'un peuple africain, les Bambara, leur vie psychique, sociale, religieuse. Anthropos Bibliothek, 1910), and C. Monteil's more recent "Les Bambara du Segou et du Kaarta", Paris, 1924.

The sketches of houses with numbered parts and an account of the function of these is illuminating, but the section on technical processes connected with metal work, weaving, and building of canoes is sadly in need of illustrations. A few sketches would aid one's imagination and relieve the tedium. In a book of three hundred pages only three plates are given. A section on trade is particularly valuable in giving what I believe to be the most complete account of the transactions and commodities of a native market. Monteil has successfully striven to remedy a common defect in ethnological studies. The extensive use of cowries will perhaps surprise some readers, for the author gives six pages of tabular statements relating to values of commodities in cowries, and his description of rapid methods of counting is lucid.

In a concluding chapter "Today and Tomorrow," Monteil considers the effects of Mohammedanism and European influences. The influence of Koranic teaching in religious belief, politics, and morals has given a new impetus to industry and agriculture, but under the veneer a strong Negro background of indigenous culture

exists. One of the most important contributions of European enterprise is a scheme of irrigation which may change the entire outlook of agriculture, land tenure, and trade.

The historical aspect of this study leaves the impression that the most necessary method of approach, now that the broad outlines are known, is intensive study of individuals and village communities. Broad historical concepts are indispensable, but they do not achieve their aim as interpreters of culture and a guide to administration unless a more localized and detailed study is undertaken to show the result of the triangular play of Negro, Mohammedan, and European cultures.

Absence of an index is a grave omission which will make burdensome the student's task of fully utilizing the wealth of material presented by the author, who has, however, aided the research worker with a short bibliography.

WILFRID DYSON HAMBLY

AMERICA

A Study of the Delaware Indian Big House Ceremony. FRANK G. SPECK. (192 pages, 26 figures, 4 plates. Publications of the Pennsylvania Historical Commission, volume II. Harrisburg, 1931.)

The early destruction of the pre-Columbian cultures of the Atlantic seaboard has left a gap in our records which, increasingly difficult to fill, is becoming the more important the clearer we come to visualize eastern North America as the meeting-ground of two cultural streams: the ancient northern culture, still represented perhaps by the northeastern Algonquians and in part the Eskimo, and the southern wave of influence communicated to Algonquian peoples who had migrated into the Southeast by Iroquoians and Muskhogeans primarily. For the southeastern Algonquian peoples the labor of rescue and cultural reconstruction has yielded only hints and suggestions of the subjective or mental aspects of former life in the region. To this statement the study of the Delaware forms a notable exception. The present volume, taken in conjunction with the work of M. R. Harrington[1] and with further publications promised by both Professor Speck and Mr. Harrington, indicates that future inferences as to the spiritual life and thought of the Algonquian peoples of Virginia and the Carolinas will take as their base the religion of the Delaware.

In spite of a long series of contacts and misfortunes the Delaware have been particularly tenacious of their ancient religious ideas and ceremonies, and we have the testimony of records as far back as the early seventeenth century that the Big House ceremony and associated beliefs are essentially pre-Columbian Delaware. In this study the Big House ceremony is presented in text and translation, accompanied by detailed footnotes and a lengthy explanatory introduction.

[1] Some Customs of the Delaware Indians, UPM-J 1, no. 3; Vestiges of Material Culture among the Canadian Delawares, AA n.s. 10; no. 3; Preliminary Sketch of Lenape Culture, AA n.s. 15, no. 2; Religion and Ceremonies of the Lenape, Indian Notes and Monographs, Museum of the American Indian, 1921.

Like most of the natives on the Papuan seacoast and on the islands of the South Seas the natives of Rossel use outriggers to steady their fragile canoes in the rough seas. As a rule these boats are adorned with brightly colored barbaric designs.

On Rossel Island, the most easterly of the islands comprised in the territory of Papua, there formerly lived some of the most notorious of South Sea cannibals. It is said that nearly three hundred Chinamen, wrecked here in 1859, were eaten almost to a man.

AN ISLAND OF SORCERY IN MELANESIA

Exploring the Mysteries of Papua's Remotest Island—Primitive Capitalists and Their Gruesome Customs—The Lurid Career of a Cannibalistic Despot

By W. E. ARMSTRONG

Late Assistant Anthropologist to the Papuan Government

IT WAS my good fortune, after an experience of about a year in New Guinea on ethnological work for Cambridge University, to be given an opportunity, as Assistant Anthropologist to the Papuan Government, to investigate the habits and customs of Rossel Island, which lies at the most easterly point of the territory of Papua. The customs of the people of Rossel Island were rightly supposed to differ from those of the inhabitants of the better-known islands lying west and stretching more or less continuously from Rossel to the mainland of New Guinea. Judge Murray, a Lieutenant-Governor of Papua, described these natives "as having been about as murderous a lot of people as can be found in Papua"; others have ascribed to them an extreme peacefulness and gentleness of disposition. Both of these views, paradoxical though it sound, contain a large element of truth. Among the Rossel Islanders revolting forms of murder were once customary owing to the prevailing cannibalism. It is a well-established fact that some three hundred Chinamen, wrecked on the island in 1859, were eaten almost to a man. Earlier reports refer to the customs of smothering or breaking of bones. This was usually done at night, the victim being surprised in his sleep. Another peculiar habit mentioned in early reports was that of punishing a man for adultery or other crimes by killing the woman who cooked his food. Add to these scraps of information such stories as that of a sacred island, lying to the east of Rossel, where the visitor must use a special language, and it may be imagined what my feelings and expectations were when at last

THE WHITE MAN'S BODY GUARD

The two strapping Papuan policemen and the cook-boy who accompanied the author to the island of Rossel were not as brave as they appear to be. Among the natives of the neighboring islands Rossel has a most sinister reputation, and these powerful Papuans, despite their heavy rifles, were in constant superstitious fear of the terrible evil power of the Rossel sorcerers.

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ARRAYED FOR THE SACRED DANCE

Before they perform the grotesque ritual dances in honor of their cruel god Wonajo, the Rossel Islanders smear their faces with daubs of paint and bedeck themselves in their flimsy finery. Across their shoulders some of these men carry the long branches that are waved through the air during the terpsichorean rite. The clapping of hands supplies the monotonous rhythm, for the drum is unknown to these primitive people.

SARTORIAL ECONOMY

The ordinary costume of the Rossel Islander consists merely of thin strands of rope wound round the waist and draped over the thighs. This islander has greatly enhanced his appearance in the eyes of his fellow natives by the pair of valuable arm shells which he wears.

I reached the island after several days' sailing. The natives of Rossel Island were puzzled by my appearance there. The islanders regard all white men as being absurdly irrational. Many actions of the white man, particularly his laws favoring monogamy, are explained on the basis of madness. But the white man's madness generally takes certain definite forms which we can roughly class as government - madness, trader-madness, and missionary-madness. As a government official I was naturally supposed to be afflicted with government-madness, until it was discovered that I was a different type than any to which the natives had been accustomed. My interest in native customs immediately excited suspicion. It is not surprising that the activities of an anthropologist should have seemed both odd and dangerous. The interest of the government in cannibalism had led to interference with this cherished institution, and the government officer who had last visited the island had shown a marked bias in favor of monogamy. If, then, I showed an undue interest in the Rossel gods it could only be preparatory to further interference.

A VILLAGE POLICEMAN AND HIS PRISONER

The islander on the left has just been taken into custody for having killed his wife in a fit of anger. In order to prevent the criminal from escaping it was only necessary to attach a pair of handcuffs to one of his wrists. Thereafter he was permitted to wander about unguarded and he made no effort to escape. The full horror of his crime was not felt by the islanders who are accustomed to look upon women with the most profound contempt.

I had been told of the existence of a certain stone at the east end of the island which was so sacred that natives, passing it by canoe, would lower their voices. This stone was mysteriously associated with the welfare of the island and its inhabitants. My questions concerning this revered object met with only evasive answers and I began to think that Rossel Island was a barren field for investigation. Fortunately I soon found the reason for my difficulties. One of the village policemen, that is, a Rossel native who had been given a uniform by the Government and a salary of a pound a year, had started the legend that my purpose on the island was indeed a grim one. The stone about which I had expressed curiosity was one of the central objects of the religious cult of the Rossel Islanders. To them this apparently commonplace object was both snake and man, and the male ancestor of the race. The ground in the neighborhood of this stone is strictly tabu, or forbidden, to all but one priest who has in his possession certain spells which enable him to enter this territory and approach the stone without danger to himself and the community. This priest has a very important though simple function to perform, namely, that of keeping the land surrounding the sacred stone, the *yaba* as it is called, clean and tidy, free from fallen leaves and branches of trees and from seaweed or other debris washed up at high tide. Failure properly to carry out these functions would, it is believed, lead to dire calamity, to infertility, and disease, if not to more violent and immediate catastrophes, such as the disappearance of the sun and moon or of the island itself.

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BLOODLESS BUTCHERY

The killing of a pig on Rossel Island is a bloodless but exciting event. After a hot pursuit through underbrush and thicket the animal is captured. Struggling and bellowing frantically it is held by half a dozen natives and put to death by strangulation or smothering. This strange method of butchery is peculiar to Rossel Island; it is practiced nowhere else in the world.

It must be remembered that the dangers of shipwreck round about the coast of New Guinea are greater than the dangers from natives in any but the remotest districts. Even if a person does get stranded among hostile cannibals—and this is unlikely to happen—the chances are he will not be eaten. The ordinary traveler is forced to wander around with all sorts of absurd little craft. He encounters violent squalls which appear suddenly out of a dead calm, tide-rips which look quite harmless until you are in them, bits of reef which are where they ought not to be, and perhaps even a water-spout. No doubt the long-time resident in New Guinea would have been quite unperturbed by such a trivial incident on the water, and would have continued to beat up against a vicious wind. I preferred a tent for the night on a strip of mud.

My Rossel crew did not appear to relish the prospect of spending the night there and departed to a village some distance away. My police and cook-boy discovered a rough shelter on piles close by while I settled down for the night. About midnight I was awakened by movements outside the tent and found that one of the two lamps I had left burning had gone out. I relit this two or three times in the course of the night, for each time it expired I was disturbed by a repetition of these movements. In the morning I noticed the tracks of two large crocodiles within a few feet of where I had been sleeping, and the reptiles themselves were observed by my police a little way off in the mangroves. Ignoring the weather I moved that day. I was informed that these crocodiles were really deities of a sort, guardians of a *yaba* a few hundred yards away.

Another instance of the very material nature of some of these deities

ROSSEL ISLAND MAGNATES

The gentleman on the left, who is the proud possessor of a shoddy suit of European clothing, holds in his hand a small fortune in Rossel currency—the little shells with which the islanders carry on their commercial transactions. The native on the right holds a valuable ceremonial tomahawk which is security for a handsome loan that he has just made.

was given me by an Australian who ventured up a hill where a minor snake - deity was supposed to dwell. One Rossel native was, with much difficulty, induced to accompany him. At the summit, peering over a ledge of rock, they saw simultaneously a reptile of prodigious size. The departure of both observers was too hurried to allow of further investigation.

Although these various *yaba* are active, for good or evil, more or less in their own right, there is a unifying conception of a supreme deity, who orders the universe through the activities of the various *yaba* who may be regarded as subservient deities. This supreme deity, known as Wonajo, resides usually on the top of the highest mountain on Rossel, which is held in great dread. By day, Wonajo dwells on Mt. Rossel as a snake, which may swell to enormous proportions if it is angered by the approach of human beings. He is then liable to devour all who are within range and to cause fearful thunderstorms. By night he takes on the human form and patrols the island, visiting the various *yaba* to see that everything is in order. It is also believed that Wonajo spends much of his time in a beautiful land that lies at the bottom of the huge lagoon which surrounds Rossel and occupies, at the eastern and western extremities of the island, an area of some hundreds of square miles. This land is the true home of the gods, and the sacred objects of the *yaba*—stones, trees, snakes, crocodiles—are believed to be present here in human form. It is also the paradise of the good, that is, of small children who alone are not acquainted with sorcery, which is synonymous with evil. In this paradise, immortality and perpetual youth are enjoyed, conditions denied to all others except the victims of cannibalism.

I was fortunate in being able to make a visit to the *yaba* of Wonajo. This was facilitated by the kindness of Mr. and Mrs. Eric Osborne, members of a family of planters who had lived on the island for many years. I think the Osbornes were the only white people who had ever visited the top of this mountain. The track which they had originally made for the last mile or so of the ascent had since become overgrown, but fortunately the undergrowth is not very dense at this height. On the whole, the thin forest of rather stunted trees

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What more natural, then, than that my inquisitiveness should be regarded with suspicion and that the legend should develop that I intended to enter this forbidden ground and tamper with the holy of holies! It would be futile to expect a mad government to listen to reason. Therefore the best thing from their point of view was to be as evasive as possible and await developments. Needless to say, as soon as I learned this, I hurried to reassure the natives. Apparently I succeeded in convincing them that I had no intention of committing any sort of sacrilege, and that I would, on no account, enter the *yaba*.

Having convinced the population that I had no evil designs and that I was interested in their customs for their own sake, most of my difficulties came to an end. A month of barrenness was succeeded by a period of activity, during which information was forthcoming with a readiness I have not experienced elsewhere in New Guinea. Doubtless, however, the majority of the people regarded me as a harmless lunatic, for the average native has naturally no reflective interest in his own institutions. Only the exceptional native, the priest or sorcerer, can really enter into the spirit of the ethnologist's inquiries.

The peculiar religious ideas of the Rossel Islander now became manifest. The *yaba*, which caused the initial difficulty, turned out to be only one of fifty or more similar sacred spots scattered throughout the island. In most of these *yabas* the central feature was a stone which had to be kept under observation by a priest in order to see that it did not become littered with débris of any kind. In most cases, it was believed that some animal, generally a snake or crocodile, acted as guardian of the *yaba*, killing all who came near except the one priest armed with the appropriate spell. These *yabas* were of various degrees of importance, controlling such processes of nature as the winds, the rain, the succession of seasons, the rising and setting of sun and moon and the growth of food-plants. Health and disease were also dependent on these mysterious centers of force. Epidemics of disease were always countered by ceremonies performed at the *yaba* which controlled the disease in question.

MEMBERS OF THE ISLAND BALLET

On Rossel Island women are rigorously excluded from participation in all the native dances. However, the local prejudice against women does not prevent the men from wearing the women's grass skirts during certain religious dances. The small grass baskets which the old dancer holds are an important part of this ceremonial costume.

A KITCHEN UNDER THE PALMS

One of the most primitive methods of preparing food—cooking by means of hot stones—is still practiced on Rossel Island. The ignorance of the use of pots, which are common among the savages of the neighboring islands, indicates the isolation in which the Rossel Islanders have lived. Only recently have pots been introduced among a few of these primitive people.

The widespread distribution of these *yaba* was forcibly brought home to me one night by the accidental discovery that I was camping within a few hundred yards of one which was credited with a solely maleficent function. The night being fine and moonlit, my cook-boy and one of my two police had gone out in a dingy to fish. They did no fishing. Suddenly in perfectly calm and shallow water through which the sandy bottom was plainly visible the dingy was violently rocked as by an invisible hand. The two boys were struck with terror, for nothing was visible above or below the water. The dingy returned with considerable speed, and I was urged to leave this dreadful island as soon as possible. Matters were made worse when the village policeman appeared and pointed out that the phenomenon had occurred by the side of a sacred tree which was guarded by a huge sting-ray. The sacrilege of my boys, and in particular the added insult of a police uniform, had no doubt aroused the anger of the *yaba*, which would probably revenge itself by causing the sickness and death of my two boys. This was an awkward problem to deal with, for it was necessary for me to ridicule the idea in the presence of my cook-boy and policemen or they would probably have sickened and died. At the same time, it was essential for me to express my belief in the *yaba* in the presence of the Rossel natives for the sake of future ethnological work. The compromise effected evidently worked, for no sickness developed, though my cook-boy, who had formerly spent all his spare moments in the salt-water, never ventured there again while at Rossel. He was also very careful to keep me between him and the evil thing which he was still half-persuaded was after him. Although I carefully examined the place where the canoe was shaken I was unable to find any cause for the strange occurrence.

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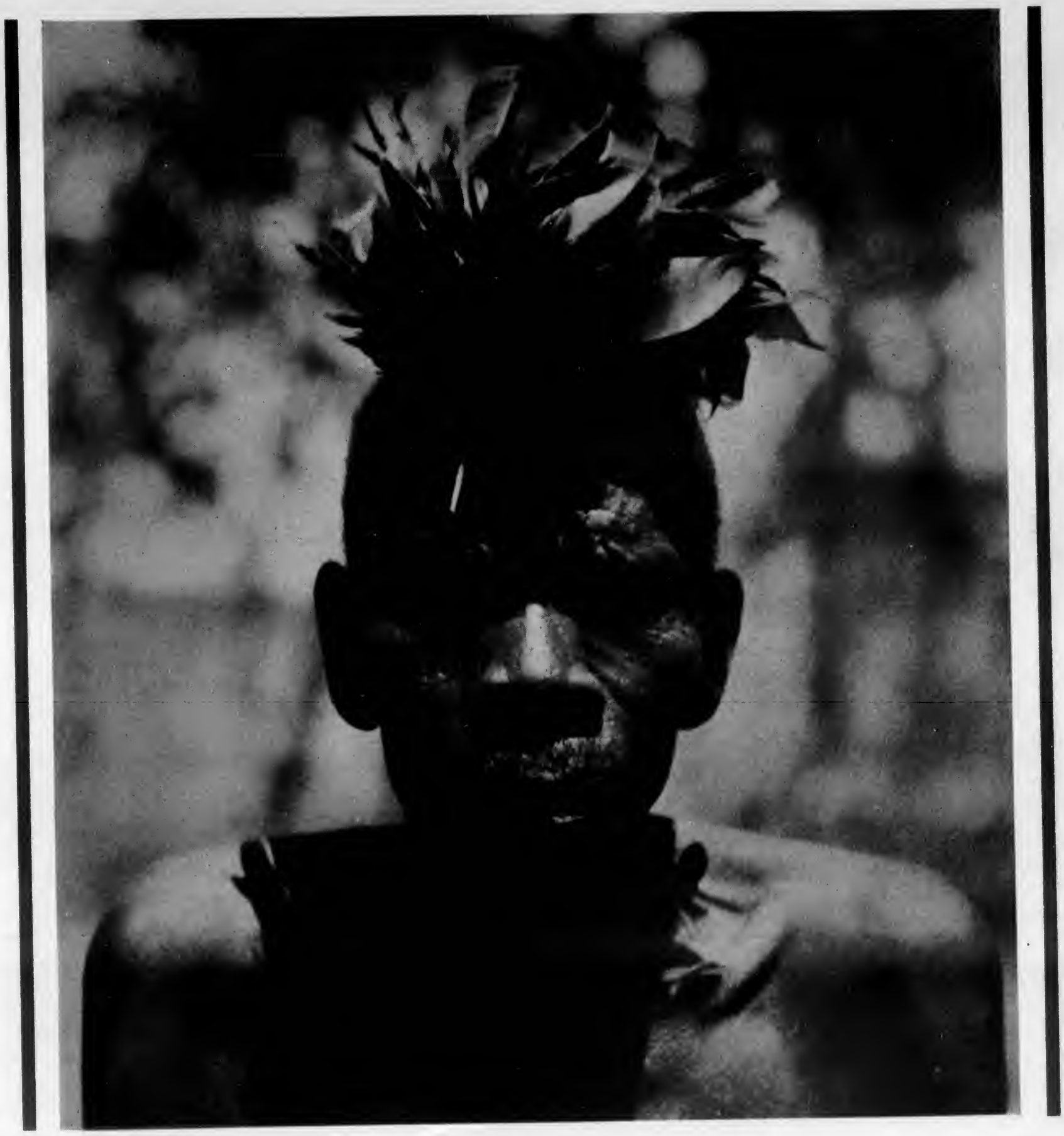
MEET A SAVAGE KING

CHIWALI III, PARAMOUNT CHIEF of the Lalas in Central Africa: the potentate whose hospitality Lucy Pope Cullen recounts in the foregoing article. He wears the ceremonial head-dress of feathers denoting his ancient power of life and death over his subjects.

The following photographs which tell the story of their unusual visit were taken by A. Douglas Cullen, the author's husband



{Nat. History - Am. Mus.
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THE ABOVE PHOTOGRAPHS illustrate the Lala custom of wearing lip rings. While purely ornamental now, the original use of the lip ring was to disfigure a girl so that Arab slave traders would pass her by in their search for fine-looking physical specimens. The ring is carved from a piece of kalabash or ivory, in the shape of a collar button, and fits into a vertical slit cut through the upper lip. Occasionally one is worn in the lower lip too

(Below) PLAYING CHISOLO, an intricate game of Arab origin, in which a number of stones are moved about a series of small holes scraped in the ground. The game involves more skill than chance. Variations of chisolo are popular as a method of gambling throughout Africa.

(Below) LALA WOMAN AND CHILD. Note ornamental "tattoo" marks on face and body. The Lalas are a matrilineal tribe. This custom with them is based on the idea that there is seldom much doubt about the identity of a child's mother. Hence all children belong to the totem of their mother, and the little boy shown here might, upon growing up, marry a close relative of his father's, owing to the fact that his father's totem is different and his father's relatives consequently unrelated to him

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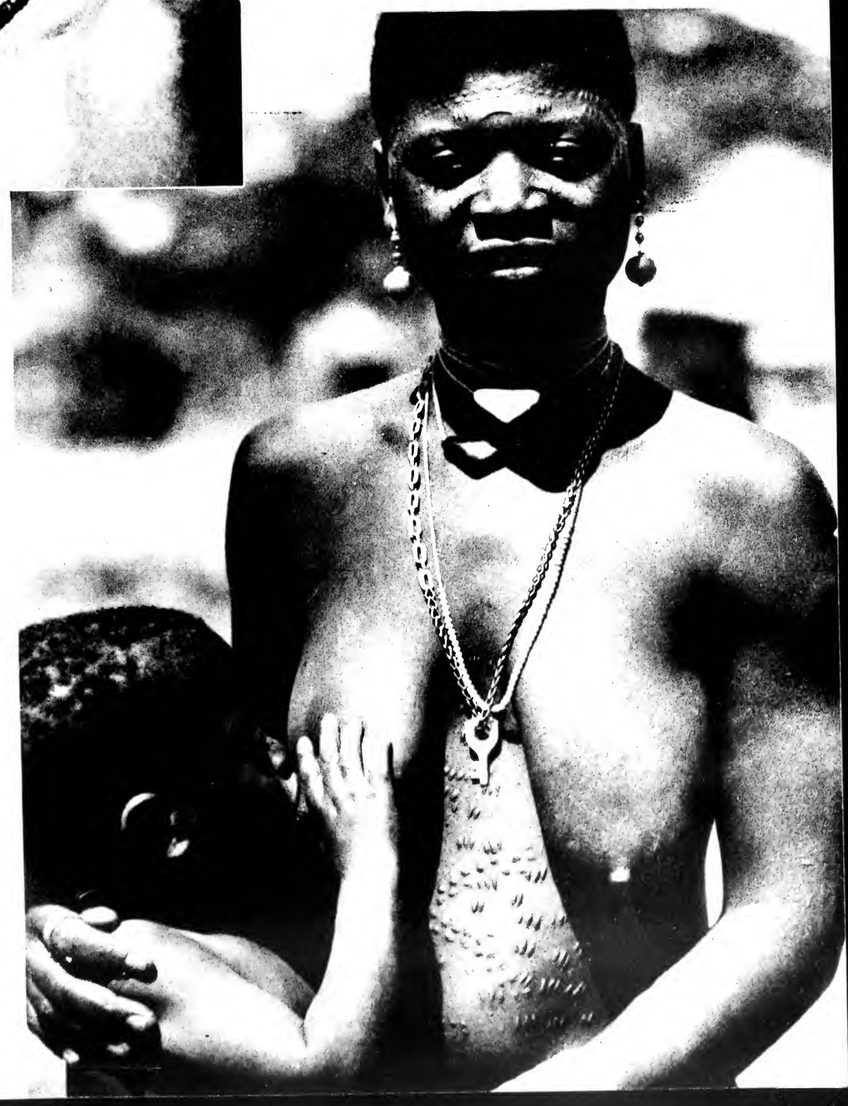


TWO GIRLS OF CHIWALI'S tribe threshing grain

WINNOWING: the chaff is blown away by the wind

THE VILLAGE SMITHY, fashioning a shovel blade. *(Below)* A Lala making reed baskets

A LALA MAN carving a knife sheath

WRITING ON THE DAILY life of Chiwali's tribesmen, Lucy Pope Cullen remarks: "All work proceeded at a leisurely pace, alternated with long periods of rest. . . . Watching the various activities, we were often struck by the curious way in which work was divided between the sexes. The amount of physical exertion involved apparently had nothing to do with it. . . .

"Men clear the ground of trees, women hoe and harvest crops, grind grain into meal, bring up water from the river, do all the cooking and look after the children. A mother always carries a small baby tied to her back, no matter how heavy the task."

"THERE ARE NO LALA SPINSTERS," the author continues. "Each girl is married as soon as she reaches maturity, her mother carrying on negotiations with all suitors. The successful contender pays for his bride in produce, livestock, and labor in his mother-in-law's service."

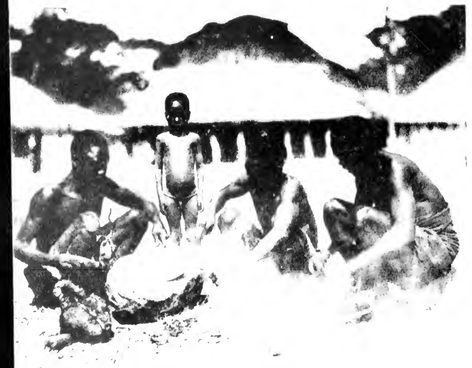
The most serious trouble that can arise in a Lala marriage is lack of offspring. If a marriage is barren at the end of a year a couple goes to the chief. Each lodges complaint, and permission is granted for them each to try a different mate. After some months, if the woman comes back to the chief triumphantly displaying a baby, and the husband is unable to show one, he has to pay his former wife twice, once for having been a poor husband and once for wrongly placing the blame on her.

A LALA PIGEON HOUSE, built on stilts to keep out snakes and animals

ONE OF CHIWALI'S tribesmen weaving a grass mat

AMONG THE LALAS the women make the pottery

LIKEWISE the women carry the water from the village water-hole. *(Below)* Lala woman smoking



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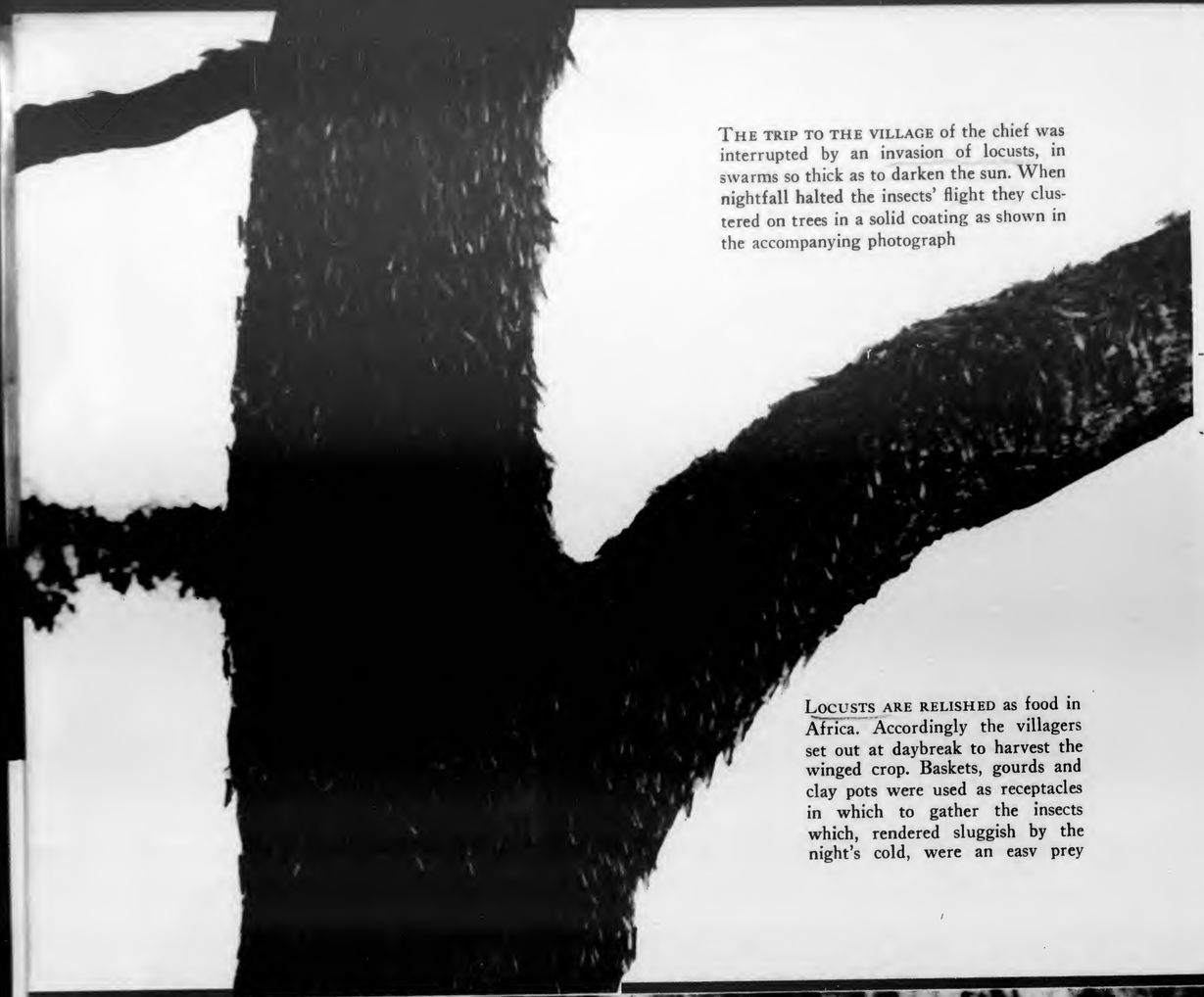

THE TRIP TO THE VILLAGE of the chief was interrupted by an invasion of locusts, in swarms so thick as to darken the sun. When nightfall halted the insects' flight they clustered on trees in a solid coating as shown in the accompanying photograph

LOCUSTS ARE RELISHED as food in Africa. Accordingly the villagers set out at daybreak to harvest the winged crop. Baskets, gourds and clay pots were used as receptacles in which to gather the insects which, rendered sluggish by the night's cold, were an easy prey

(Above) THE CHIEF'S hut, in the center of the village

CHIWALI III, after meeting his guests, sang an eulogistic welcome to them to the accompaniment of his curious marimba

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Above: Locusts are roasted in the ashes of a fire

DANCERS OF THE "ROYAL FAMILY." Two of Chiwali's sisters are shown, Wangwa *(second from left)* and Munsele *(at right)*. The leopard dancer is in the center. The dance, performed especially in honor of the white visitors represented the greeting of a successful leopard hunter returning home with his prey

(Right) AN ELEVEN-YEAR-OLD GIRL whose head-dress signifies that she is ready to begin her life as a woman

AS CHIWALI GUESTS, the crowning feature was the opportunity to witness the ceremony in honor of the dead chiefs. This centered about the Spirit House shown below, where ancestral relics were displayed on a mat and venerated with primitive religious fervor

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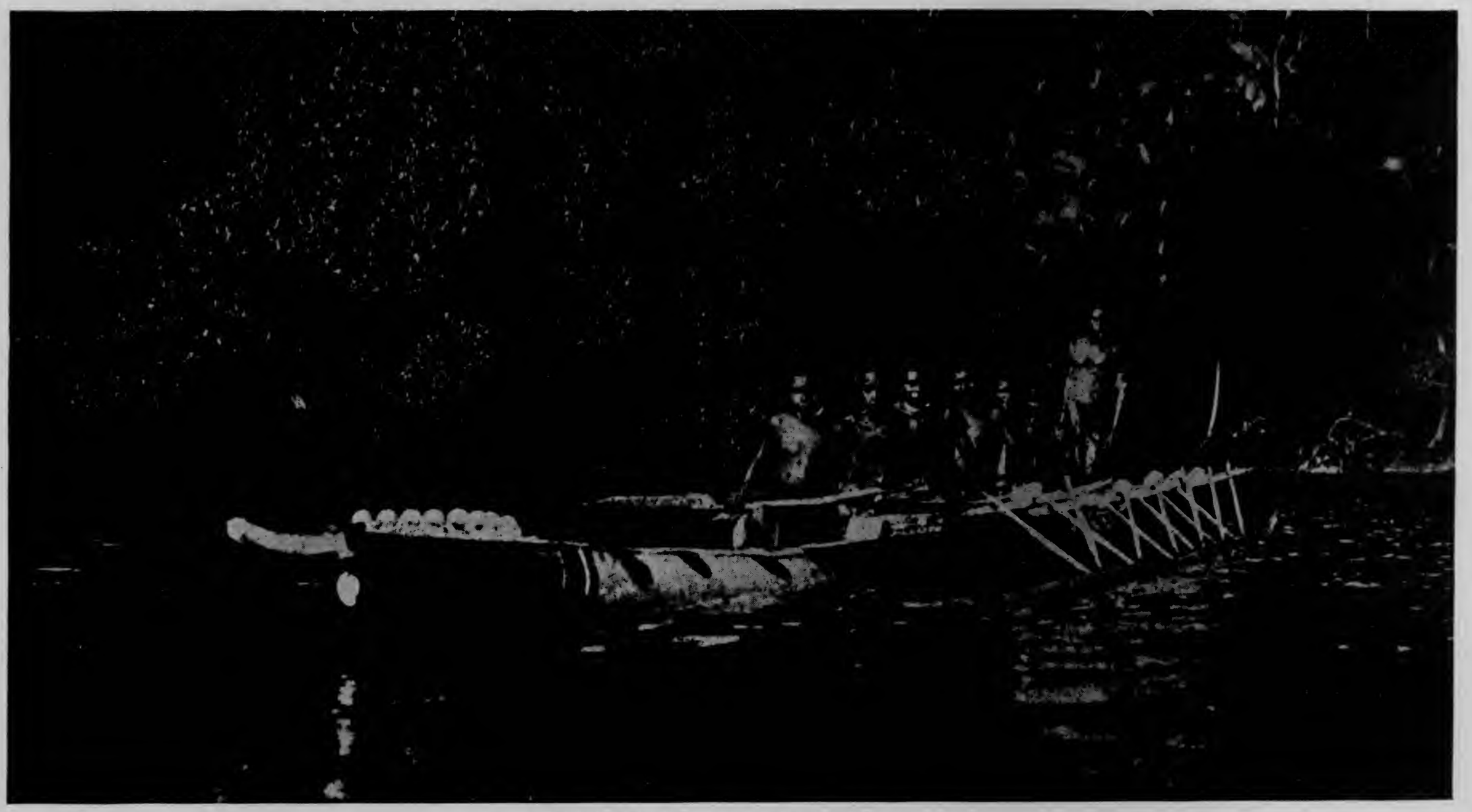
LITHOGRAPHED BY



LAUNCHING A SACRED CANOE

The chiefs of Rossel Island possess elaborately decorated canoes which represent to the natives one of the highest forms of regal splendor. These boats are used principally for races between the chiefs. Women are forbidden to ride in them under penalty of death.

made the precipitous climbing comparatively easy. Although the mountains of Rossel are almost perpetually shrouded in mist, the day we chose for ascending the peak was, for a few hours, without a cloud. We were afforded an unique spectacle, for we had an uninterrupted view of almost the whole of Rossel and its encircling reef—even the reef of the neighboring island of Sudest could be followed to a distance of fifty miles or more. The emerald greens, the brilliant purples and blues of the waters enclosed by the reef below made a picture of beauty for which a year's travel in this superbly beautiful region of the world's tropics had not prepared me. As we neared the summit, the psychological atmosphere created by native superstitition rendered our surroundings still more impressive. A few of the more enlightened natives had dared the final ascent, but as we neared the summit they hushed their voices, and finally would only talk in whispers.

To intensify the mood, engendered in all of us by this visit, we received on our way to the coast news of a murder committed in one of the interior villages. A man for no ascertainable reason had suddenly taken a stone and battered his wife to death. The murderer, with a pair of handcuffs upon one wrist only, compulsorily joined my party for the remainder of my stay on the island. He proved to be of quite a pleasant and gentle disposition. I did, however, experience some misgivings, when I learned a few days later that he had been sleeping under the floor of the unfinished hut in which I myself passed the night. The murderer was restrained merely by the belief in the efficacy of handcuffs—attached to only one wrist—to prevent him from escaping or committing further atrocities. The police evidently thought that he would be safer near me than in their own part of the village a few hundred yards away.

TYPICAL ISLANDERS

The costumes of the Rossel Islanders lack the barbaric magnificence that is found in other parts of Melanesia. Decorative ornaments and clothing are generally very simple, and even the nose ring that is favored so much in Papua is not seen very often. Despite the fact that Rossel Island lies in the very center of Melanesia, the island's culture and customs are conspicuously unlike anything found not only in Melanesia but in other parts of Oceania.

To return to the habits of the Rossel natives, a feature of their culture, even more extraordinary than their religion, is their economic system. It is rare for primitive peoples to have any systematic method of charging interest on loans; yet among the Rossel Islanders the conception of interest is dominant to such an extent that the money-values are so arranged as to facilitate the calculation of interest-charges. There are two different but parallel currencies: one known as Dap, the other as Kö. The coins were probably manufactured in the forgotten past, and they are made of shells. There are twenty-two values of Dap coins, but these are not simple multiples of the lowest denominations. Each value is related to the next above

(*Continued on page* 54)

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(*Continued on page* 54)

MOTORING IN EQUATORIAL AFRICA

Revolutionizing Travel in the Dark Continent

By RICHARD ST. BARBE BAKER

Late Assistant Conservator of Forest Kenya Colony and Nigeria

It is obvious that this frightened youngster has never seen either a motor car or a camera before.

TREKKING in the tropics is no longer the arduous business that it once was. In the early days of exploration and travel, journeys were made on foot at considerable risk and at the mercy of the tropic sun and torrential rains. When one looks back on what our fathers accomplished, handicapped as they were by lack of motor transport, their endurance seems astonishing. Even on foot they did much, but their journeys were of necessity restricted on account of time and cost.

The coming of the light car and motor truck has now largely solved the problem of transport. Today, thanks to the opening up of new roads, the explorer, settler, trader, or government official can travel in comparative comfort in spite of the exigencies of the climate.

The record of British colonization in Equatorial Africa has been that of peaceful penetration. When its history comes to be recorded, we shall learn how much of its success in recent years has been due to the internal combustion engine. Although the river ways aided considerably in the development of the country, that type of development was restricted. The hinterland was never easily accessible until the coming of the motor car. Today, improved roads have opened up to the motorist vast tracts of territory which were previously inaccessible except to a few.

At first sight the motor car called forth wonderment in peoples who had not then reached the wheelbarrow stage of culture, but in the course of a short decade the use of the motor car has increased at an extraordinary rate.

During the course of my work as Assistant Conservator of Forests in Equatorial Africa I have lived in the Highlands of Kenya and visited Tanganyika, Uganda, the Congo Forest and Nigeria. I have been from Cape to Cairo and have probably motored farther in Africa than any of my contemporaries. Furthermore, it was the exception rather than the rule for me to use the best roads. I traveled in a light car, which was invaluable in trail breaking, and in the course of a ten-thousand-mile trek I was not once delayed through a breakdown or a serious accident. Throughout the whole of my journeys, the only damage other than that necessitating tire replacement was a bent starting-handle and a few dents to a fender. The bent starting-handle was the result of a spectacular drop over a steep embankment.

I was driving from Lagos to Ibadan in the Southern Provinces of Nigeria. Rounding a sharp bend on the side of a hill, I met a loaded lorry coming towards me, completely out of control. To my right was a steep drop over an embankment, and to my left, the side of a hill. The road was narrow so that it was impossible

OBSTACLES TO MOTORING IN AFRICA

Fallen trees offer one of the commonest obstacles to the motorist in the African jungles. Sometimes, as in the picture on the left, it is possible to drive under the trunk. More frequently, however, the tree must be sawed or chopped apart to permit the car to pass. At the right is a typical African motor hazard—the giant ant hill. These ant hills, which are often higher than a man, greatly increase the difficulties of trail breaking.

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THE FIRST AUTOMOBILE COMES TO THEIR VILLAGE

Today the motor car is penetrating into the most remote sections of Africa. New roadways are being built everywhere, and some African chieftains have actually become enthusiastic motorists. To these villagers in the hinterlands, however, the author's car presented a new and astonishing spectacle.

for me to pull to one side. It seemed that nothing could prevent a head-on crash. An instant's delay meant positive disaster, so that almost automatically I decided to take the leap over the sheer edge, and dropped into thick bush fifteen feet below the level of the trail. Fortunately, I was unhurt.

After having cut away the bush to make a path by which to enable me to extract the car, I found, to my pleasure, that the engine was in order, and the car undamaged, except for the bent starting-handle. So with little delay, and the help of friendly villagers a couple of miles away, I was able to bring the car up the bank on its own power. This curious fall was my most serious mishap during hundreds of miles of motor trekking in tropical Africa.

In the course of one of my tours, I conducted a party of chiefs and headmen to the Calabar Exhibition across the Niger. A convoy of cars and vans carried the chiefs, their retinues and exhibits. I thoroughly enjoyed the keen and intelligent interest in the driving of my car shown by the Ashodi of Benin, who was my passenger. Other chiefs were owners themselves. One of them, Chief Momu of Auchi, was an all-round sportsman and the proud owner of a race course.

The readiness of the chiefs in adapting themselves to the use of the motor is shown in their increasing tendency to demand a high-powered car which will become practicable as the roads improve. Already, during the past few years, thanks to the policy of the government, there have been great developments in road improvement and construction. This is especially notable on the road from Lagos to Ibadan and long stretches of it are now equal to any first-class roads in other parts of the world. Incidentally, the bend on the side of the hill and the scene of my adventure has been more than trebled in width, and now there is a splendid sweep upon which one can speed without fear of a collision.

EXAMINING A MOTOR CAR

Naturally the first sight of a motor car calls forth wonderment and endless curiosity among a people who have not reached the wheelbarrow state of civilization. The author's boy is demonstrating the use of his car to old men in the tropic forest.

Occasionally, during the tornado season in the rain-forest region, one comes across a fallen tree, but delays need not be long, for no motorist in these parts would be without a sharp axe. When a number of sturdy tribesmen arrive on the scene, little time is lost in cutting a way through.

In some parts of Africa travel is very difficult, if not impossible, during the rainy season. In Nigeria, however, with a light car, one can trek right through the rains. In some cases newly cut trails are improved and hardened by a heavy downpour, and in consequence traveling is made easier. It is safe to say that on laterite and sandy soils the roads are equally good all the year round. On the low-lying grounds where almost pure sand is met with the roads are even heavier in the dry season.

One of the most thrilling experiences I had was in the rain forests on the road from Sapoba

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An Island of Sorcery in Melanesia

(*Continued from page* 35)

on the principle that, if a coin of the lower value be lent for a few days, the accumulation of interest will require repayment by the next higher in value. If the loan is for twice this period, then a coin next but one in value will represent the original capital plus its accumulated compound interest. Thus, by an ingenious device, loans of varying amounts may be made for any period of time, the interest being charged at a standard rate and calling for no appreciable calculations—calculations, moreover, which, if required, would undoubtedly be beyond the intellectual capabilities of the Rossel Islander. Since the recognized rate of interest is high, this system provides ample opportunities for the more acute to exploit the community, and enables the hereditary caste of chiefs to live in comparative idleness on the interest derived from their invested capital.

The dangers of this economic system are well illustrated by the career of the notorious despot, Mbo. According to the accounts I received, Mbo, the son of an important chief, acquired a taste for human flesh in childhood. While playing with another boy, a commoner, he accidentally received a small clod of earth in his eye. He went in tears to his father begging that his playmate be killed for the mishap, and that he be allowed to eat some of the flesh. His father, having in vain tried to dissuade him, reluctantly granted his wish so that the son ate of his butchered playmate. As a result he developed an inordinate desire for the gruesome luxury of human flesh. On the death of his father he devoted himself to accumulating wealth so that he might indulge his horrible appetite. A man of considerable ability, he succeeded in gaining control of most of the money on the island. Human flesh was an expensive delicacy on Rossel, even before the advent of the white man. The consumption of human flesh was a ceremonial connected with the death of important persons, and rarely occurred at any other time.

The procedure appears to have been as follows. In this region death is believed to be due to sorcery, unless it result from violence or the maleficence of some *yaba*. Someone, often as a result of divination, was accused of causing the death, and as a penalty he had to provide one or more human victims for a feast. The victims were generally acquired by treachery. With one or two accomplices the accused would visit someone, even a friend, and preferably an orphan or one whose loss would not be much resented by the community. Having decoyed the boy or girl into the bush, he or she would be held while a spear was thrust under the armpit into the heart or lung. After the victim had been eaten, the relatives had to be compensated by large payments extending over a period of years.

Clearly, the recognized opportunities which our financial magnate had of indulging his perversion could not have been frequent, but the power of wealth enabled him to overcome custom and to create his own opportunities, since the relatives of those he ate were conveniently pacified by payments of money. The island eventually became so terrorized by this fiend that he was able to give full reign to all his desires. He would approach a girl and address her as wife; she dared not refuse. He would take possession of a canoe belonging to another chief, and nothing would be said. If irritated by mosquitoes, he would order his servants to kill a few people as a vent for his anger. When he was very hungry and in a hurry he would even select one of his own attendants and have him cooked.

The *St. Paul*, which carried some three hundred Chinese and a few Europeans, was wrecked on the Rossel reef during this reign of terror. There seems to be little doubt that very many of these Chinamen were consumed by Mbo, the cannibal of cannibals. It seems that, after the Europeans had left in all the available boats, most of the Chinamen scrambled along the reef to a little island known as Heron Island, a mile or two from the shore. Most of those that swam to the shore were killed, though some succeeded in getting away into the bush, where they were eventually caught. Those remaining on Heron Island were apparently removed in groups as they were required for Mbo's kitchen. Presumably those selected were not told what was in store for them or what had been the fate of those previously taken. The legs of the selected victims were broken to prevent escape and insure a supply of fresh meat for the next mortuary feast or for the table of the chief Mbo.

Although perhaps the story of Mbo and the Chinamen, as

(*Continued on page* 56)

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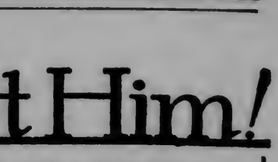

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An Island of Sorcery in Melanesia

(*Continued from page* 54)

related to me, had become embellished with picturesque but inaccurate details, I have reason to believe it is correct in essentials.

It has been possible only to touch briefly on some of the most interesting customs of the Rossel Islander in this short article, but I have selected those features which differ most from those of the islands which intervene between it and the mainland and from those of the groups of islands lying north, east and south, such as the Solomons and the New Hebrides. Throughout this wide Melanesian area, there is a certain uniformity of language and custom; yet the little island of Rossel, which lies within this area, differs profoundly in both. Here the problems of origin of language, beliefs and customs are of exceptional interest—especially to the anthropologist. It is incredible that the currency system can have been purely local in origin. Where, then, did it come from? We know of no people in Melanesia or elsewhere who have anything similar. Is it, perhaps, the only relic left of an unique economic system, developed in a more cultured community whose civilization has since been lost or modified beyond recognition? We know that Egyptian culture, of four or five thousand years ago, penetrated at least as far as the Pacific. Perhaps on Rossel there is preserved, in a degenerate form, an element of the economic culture of Egypt that existed at the dawn of history!

The Bridges of Twenty Centuries

(*Continued from page* 43)

and in Florence, the traveler is familiar; but there are dozens that he ignores. How often, for instance, does one hear of that superb bridge at Chatellerault over the River Vienne? Or of that small bridge at Chatsworth, England, an architectural gem, with its exquisitely detailed spans, its cutwaters surmounted by statues, and its lovely balustrade? Undoubtedly, the subtle proportions of the Renaissance bridges of Paris, which are so prominent a feature of the city, escape the eyes of the majority of visitors. These bridges will bear close study. It took architectural genius to make of them an ensemble not equalled anywhere else in the world.

In the eighteenth century, a revolution in bridge building took place: the engineer appeared. Formerly all the notable bridges had been designed by priests and architects; now science became a factor in design. But science did not entirely displace art. Both Perronet in France and Rennie in England, the first of the recognized engineer bridge builders, constructed bridges that were not lacking in beauty.

Bridge building in the nineteenth century is primarily a record of engineering achievement. From an architectural point of view, many of the nineteenth century bridges are ugly, some are imitative, some are merely inoffensive; but only a few are strikingly original in design.

With the development of the bridges of steel and cement, a new type of beauty is being created. It is a beauty devoid of the traditional romantic ornaments; it is cold, austere, and mathematical. The new forms emerging from the twisted masses of steel in which the world is being swathed hold a fascination that is peculiar to our age.

What will the bridges of the future be? Obviously we are moving toward the grandiose and the gigantic. Will the bridges of the new era be hideous Brobdignagian creations, or will they justify in beauty the engineering genius of man? Here is a brief and sober statement of the plans for the construction of the most stupendous bridge in the history of the world—a highway over the Hudson River at Fort Lee, New Jersey:

"A tentative report has already been made by a commission of the Port of New York. This tentative report contemplates the construction of a supension bridge comprising a central span of 3,500 feet, twice that of the Philadelphia-Camden Bridge, the longest yet built. The towers would be 650 feet high, nearly 100 feet higher than the Washington Monument at Washington. The preliminary drawings by Cass Gilbert show masonry towers (encasing the steel skeleton) and a conception of surpassing beauty, although the use of encasing masonry that no longer serves a useful purpose may be open to criticism."

After reading this it can not be said that the future of bridge building will be lacking in excitement, whatever its artistic results may be.

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TRAVEL

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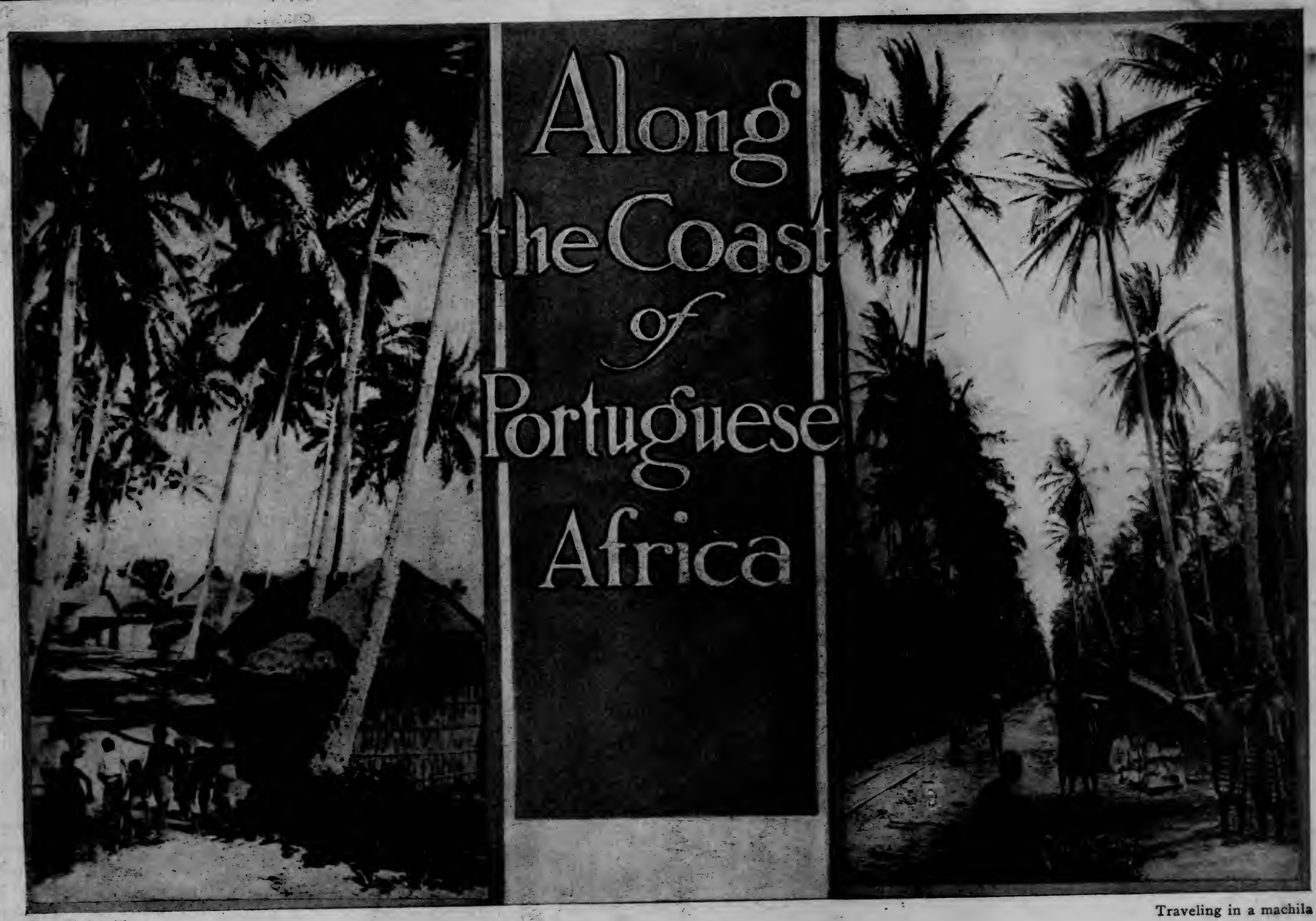

In a Kafir village

Traveling in a machila

ALONG THE COAST OF THE REMOTE LAND THAT VASCO DA GAMA DISCOVERED FOR PORTUGAL—WHERE INDIA HAS TRADED FOR CENTURIES—EUROPEAN AND NATIVE LIFE

ANNE B. T. HOWARD

Photographs by the Author

COLUMBUS was still dreaming of that search for the sea route to India which led him across the western ocean, when the bold navigators of the little kingdom of Portugal, heading their vessels southward upon the same quest, gradually found their way down the west coast of Africa to the "Cape of Storms." In 1498 the long sought goal of navigation was reached when Vasco da Gama, rounding the Cape, sailed up the East Coast and on to India. To Portugal belongs the glory of having discovered all the southern portion of Africa—and it was also hers by right of conquest. The history of her struggles against native and Arab by land, and of her staunch defense against Dutch and French by sea, reads like romance. To-day those stories of heroic deeds are hidden away in the musty pages of the old Jesuit chroniclers, and only three colonies, widely separated, remain in the possession of that little nation whose valiant seamen once led the world upon the uncharted seas.

The one Colonial possession most dear to the Portuguese of to-day is the Province of Moçambique, or Portuguese East Africa, which lies along the eastern coast of Africa from the eleventh to the twenty-seventh parallels south. Though it is rich in present possibilities, and in a past of great interest, and though its fine harbors are viewed with envious eyes by its British neighbors, it is, nevertheless, almost unknown to the world outside.

Near its southern end is Delagoa Bay, the natural port of the Transvaal and the finest harbor on the coast of South Africa. Of all the shipping to the whole Sub-Continent, some 78 per cent is received at this port. Its name has become somewhat familiar to Americans from the fact that President Kruger escaped to Europe from Delagoa Bay during the Boer War, and also from the annual newspaper story that the port has been purchased by Great Britain.

About twenty-five miles above its mouth the broad bay narrows to a wide river, the Rio Espirito Sancto. To the north there is a stretch of level beach, with cliffs thickly covered with semi-tropical vegetation. Beyond this rises a high bluff conspicuous by the rich, dull red color of the soil. At the point is a lighthouse, and further back one sees attractive houses, with the flag of Portugal floating above the highest point. This is the residence portion of Lourenço Marques, the capital and principal town of Portuguese East Africa. The shops and other business houses are below the bluff and nearer the docks.

Lourenço Marques is still popularly classed with three or four other tropical localities under the name of "white man's grave." Before

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scientific drainage and other anti-mosquito measures were put into effect, there was undoubtedly considerable fever; but even then a large part of the mortality was due to excessive drinking, and also to the fact that many, worn out by fever and dissipation in the interior, found their way to this port, only to die there. Now, with proper drainage and. mosquito-proofed houses, no one need dread malaria. The streets are well paved and clean, and both houses and streets have electric lighting.

The sandy island upon which the town of Bazaruto is built, a former Arab pearl fishery now in possession of the Portuguese

A foreign residence of Quelimane. The houses are of the low, square, Portuguese type, painted in bright blues and pinks

Four lines of electric cars give good service, and there is no purer water supply in any South African town. Most of the business houses are branches of English, German or Swiss firms, and an increasingly large white population is finding Lourenço Marques a pleasant and healthful place to live. Every country of Europe and Asia is represented in the motley life. On the streets one sees the high-class Portuguese official, the peasant police and the lancer, men of every race in the conventional white duck suit and cork helmet, English and German ladies with their tennis rackets or in garden party gowns, Indians of every rank and calling, Chinese hucksters, Portuguese half-castes dressed in the height of fashion, native police in khaki suits and red fez, Mohammedan natives from Zanzibar in white gowns, and natives in every style of clothing from white suits to abandoned coal sacks.

The Swiss Mission church at Lourenço Marques, the capital of Portuguese East Africa

While Lourenço Marques is one of the cleanest and prettiest of South African towns, it is too modern and too European to have that distinctive interest for the traveler which is found in some of the smaller places further up the coast. Lourenço Marques, Beira and Moçambique are the only ports in Portuguese East Africa at which vessels on the East Coast service call. They are comparatively familiar to travelers in that part of the world, but only Moçambique has any claim upon history. There are several smaller towns, unimportant and difficult of access, which combine with a history little less romantic than that of Moçambique a present of unique loveliness and charm. Unfortunately for the one who prefers to leave the conventional lines of travel for such spots of uncommon interest, these little coast towns are not easily reached and offer no possibilities of entertainment to the stranger. It is only when some rare fortune offers the chance that one may yield to the lure of these strange, old-new tropical towns.

Quelimane is 600 miles north of Lourenço Marques, and is reached directly only by small Portuguese coasting boats, cargo boats fitted to carry a few white passengers. A trip of six days on one of the smallest and least comfortable of these is an experience not soon to be forgotten. The cabins are just large enough for two tiny berths, there is no saloon and practically no deck. In midsummer the ship is almost intolerably close and hot, and the hundreds of Kafirs returning from the mines do not add to the general comfort. According to the Portuguese custom, no food is served until ten in the morning, except tea, a bitter, native-grown coffee, and stale tinned biscuits. "Breakfast" is served at ten, lunch at two, and dinner at six. Lunch usually consists of tinned fish, sour bread and tasteless fruit. Breakfast and dinner differ only in the number of courses, dinner being slightly more pretentious. Both meals are begun with soup made from a coarse variety of cabbage, and consist of a succession of courses of meats and fish, garnished with vegetables and drenched with a peculiarly rank oil. Following these there may be a doughy pudding, bread, cheese and coffee.

After thirty-six hours of gentle rolling on the Moçambique Channel, the boat turns into the quiet waters of Inhambane Bay, and an hour's sail up the bay gives a first glimpse of the long line of cocoanut palms marking the site of the little town of Inhambane. The town itself lies near the sea wall, against the background of palm grove.

The few white residents live in low, light-colored, plaster villas near the water front, the Governor's residence standing somewhat apart on a slight elevation. The town proper consists of two government buildings, a few offices for exporting companies and banks, the inevitable square with its kiosk and barber shop, and an open market where native women offer fruits and vegetables for sale. The square white tower of the Catholic church rising in the center of the town seems its dominant

IN THE INDIAN QUARTER OF INHAMBANE

The white streets are lined with small plaster houses of various tints. Through the open doors one sees native wares displayed, or sometimes a tailor sitting cross-legged at his work

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feature and marks its distinctness from the Indian and Kafir quarters.

Leaving the European section, one seems to step all at once out of the Continental atmosphere into a bit of the real East. The wide streets have become narrow and glistening white. On both sides they are lined by small plaster houses, set close together, and painted white or in soft shades of salmon, cobalt, buff or terra cotta. Through the open doors one sees strings of onions and garlic, gay plaid cloths, beads, cheap jewelry and large baskets of maize, monkey nuts, beans and rice. In some of the houses, instead of the display of wares, there are Indian tailors sitting on the floor with legs crossed, sewing busily. Small, solemn-faced boys, wearing the red fez or the Indian headdress, come boldly out on the streets; while their brown-skinned sisters, already holding a rich promise of Oriental beauty in their dark eyes, peep shyly out from some half-hidden corner.

Bartholomeu Dias is a new settlement, which at first sight seems to consist of a prison, a hospital and one residence

Just as the European section of the town finds its most characteristic expression in the Spanish architecture of its church, so we find the spirit of the East enshrined in its mosque. Near the water front, but somewhat distant from the center of the town, it rises against the blue of the sky, rivaling the sky in its own blueness. The flaming scarlet of a flamboyant tree beside it gives a daring color contrast.

The real Africa lies beyond the Indian quarter. Scattered through the miles of cocoanut plantations are the neat, picturesque Kafir huts, built of reeds and grass. They are far better built than most native huts one sees in other parts of Africa, and often show the Indian influence strongly. Many of them have doorposts of plaster and wooden doors painted in showy designs with strongly contrasting colors. Some are plastered inside and out, and an occasional one is square instead of round. Outside the huts one sees women hoeing "mealies" (corn), and merry little brown "picannins" chasing one another. This bit of earth, with the tall, bare trunks of the palms dwarfing the little huts of grass at their feet, the glimpses of blue sky, the half sunshine, half shadow, the laughter of bare-skinned, happy children, seems not to be of the great, rushing, hurrying, worrying world at all, but a bit of tropical fairyland, peopled with gnomes and elves and brownies.

The town hall of Quelimane. The extreme heat and malaria make it difficult for Europeans to live here

Inhambane, like many of the other East Coast towns, was originally an Arab trading station. These Arabs were traders only and lived peacefully among the natives. Through intermarriage with them they deteriorated physically and became less warlike in nature, so that they fell an easy prey to their enemies in the early days of Portuguese conquest.

The public gardens of Beira, the terminus of the Mashonaland Railway. Beira means sand, a name unpleasantly appropriate

When we remember that the discovery of South Africa was merely an incident in the deadly warfare between the Cross and Crescent which was then being so pitilessly waged, we can understand how these peaceful Arab traders received no mercy at the hands of the Portuguese explorers.

To-day Inhambane lies among her palms, an exquisite work of art done in miniature. From the waters one sees both the minarets of her mosque and the tower of her church. On her streets one sees the black gowns of her priests and the white robes of the Mohammedans. In her threefold life the civilizations of East and West and the untrammeled freedom of the children of nature meet harmoniously; but in the soft, languorous atmosphere there seems still some dim, far-away suggestion of those days of gallant deeds, when knights in armor rode their mailed steeds through tropical morasses in quest of the gold of Ophir, and slew without mercy the enemies of their faith.

Between Inhambane and Beira the boat makes two stops, but very brief ones, at Bazaruto and Bartholomeu Dias. Bazaruto was once an Arab pearl fishery, later taken over by the Portuguese and now nearly exhausted. The headquarters are on a small, low island, little more than a large sand bar, easily seen in its entirety from the ship. In the center of the island are a few palms and casuarinas, and in such shade as they afford are the houses of the eight white men resident there. Bartholomeu Dias may become an important port as the country inland from it develops. Now it is very new, indeed, and seems to consist almost solely of a prison, a hospital and one residence.

No contrast could be greater than that between Inhambane and Beira. Inhambane, lovely as a dream, lies

BEIRA'S STREET CAR SYSTEM

Narrow tracks are laid in the center of the streets, and on these small cars are pushed by native servants. Residents of Beira have their private cars and attendants

feature and marks its distinctness from the Indian and Kafir quarters.

Leaving the European section, one seems to step all at once out of the Continental atmosphere into a bit of the real East. The wide streets have become narrow and glistening white. On both sides they are lined by small plaster houses, set close together, and painted white or in soft shades of salmon, cobalt, buff or terra cotta. Through the open doors one sees strings of onions and garlic, gay plaid cloths, beads, cheap jewelry and large baskets of maize, monkey nuts, beans and rice. In some of the houses, instead of the display of wares, there are Indian tailors sitting on the floor with legs crossed, sewing busily. Small, solemn-faced boys, wearing the red fez or the Indian headdress, come boldly out on the streets; while their brown-skinned sisters, already holding a rich promise of Oriental beauty in their dark eyes, peep shyly out from some half-hidden corner.

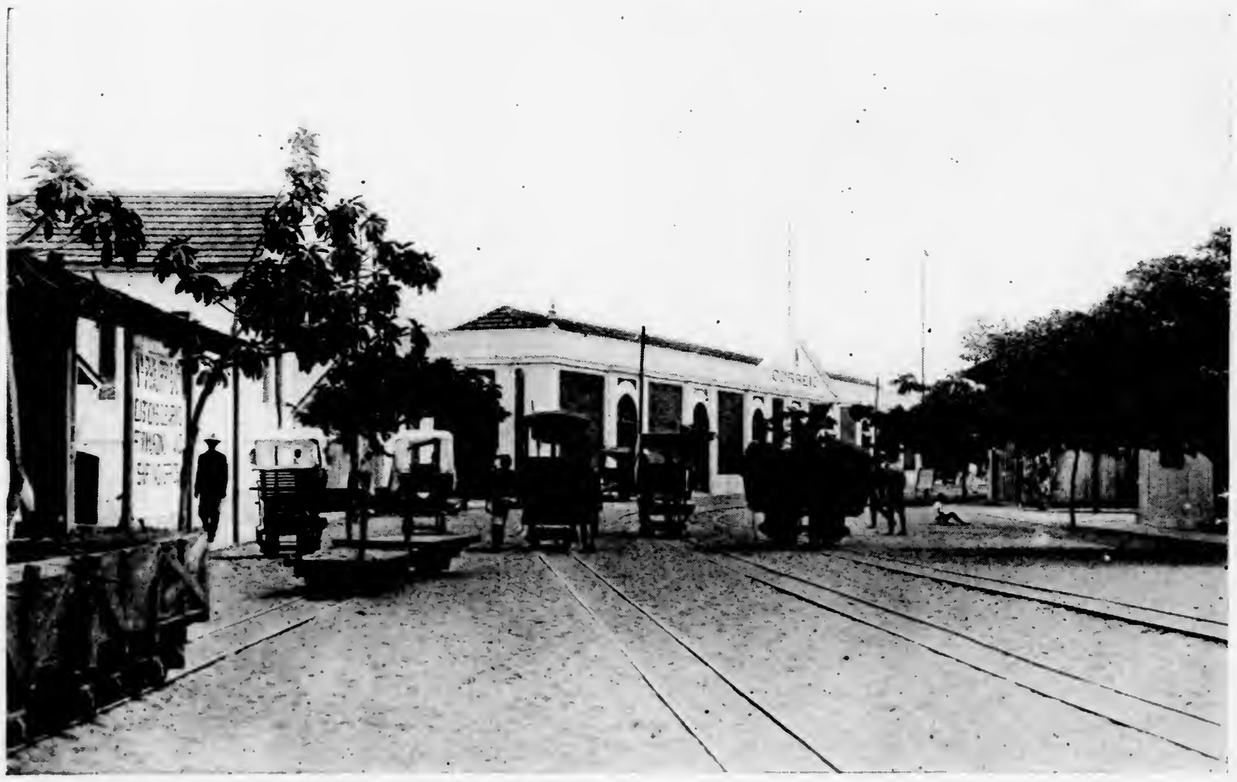
Just as the European section of the town finds its most characteristic expression in the Spanish architecture of its church, so we find the spirit of the East enshrined in its mosque. Near the water front, but somewhat distant from the center of the town, it rises against the blue of the sky, rivaling the sky in its own blueness. The flaming scarlet of a flamboyant tree beside it gives a daring color contrast.

The real Africa lies beyond the Indian quarter. Scattered through the miles of cocoanut plantations are the neat, picturesque Kafir huts, built of reeds and grass. They are far better built than most native huts one sees in other parts of Africa, and often show the Indian influence strongly. Many of them have doorposts of plaster and wooden doors painted in showy designs with strongly contrasting colors. Some are plastered inside and out, and an occasional one is square instead of round. Outside the huts one sees women hoeing "mealies" (corn), and merry little brown "picannins" chasing one another. This bit of earth, with the tall, bare trunks of the palms dwarfing the little huts of grass at their feet, the glimpses of blue sky, the half sunshine, half shadow, the laughter of bare-skinned, happy children, seems not to be of the great, rushing, hurrying, worrying world at all, but a bit of tropical fairyland, peopled with gnomes and elves and brownies.

Bartholomeu Dias is a new settlement, which at first sight seems to consist of a prison, a hospital and one residence

The town hall of Quelimane. The extreme heat and malaria make it difficult for Europeans to live here

The public gardens of Beira, the terminus of the Mashonaland Railway. Beira means sand, a name unpleasantly appropriate



BEIRA'S STREET CAR SYSTEM

Narrow tracks are laid in the center of the streets, and on these small cars are pushed by native servants. Residents of Beira have their private cars and attendants

When we remember that the discovery of South Africa was merely an incident in the deadly warfare between the Cross and Crescent which was then being so pitilessly waged, we can understand how these peaceful Arab traders received no mercy at the hands of the Portuguese explorers.

To-day Inhambane lies among her palms, an exquisite work of art done in miniature. From the waters one sees both the minarets of her mosque and the tower of her church. On her streets one sees the black gowns of her priests and the white robes of the Mohammedans. In her threefold life the civilizations of East and West and the untrammeled freedom of the children of nature meet harmoniously; but in the soft, languorous atmosphere there seems still some dim, far-away suggestion of those days of gallant deeds, when knights in armor rode their mailed steeds through tropical morasses in quest of the gold of Ophir, and slew without mercy the enemies of their faith.

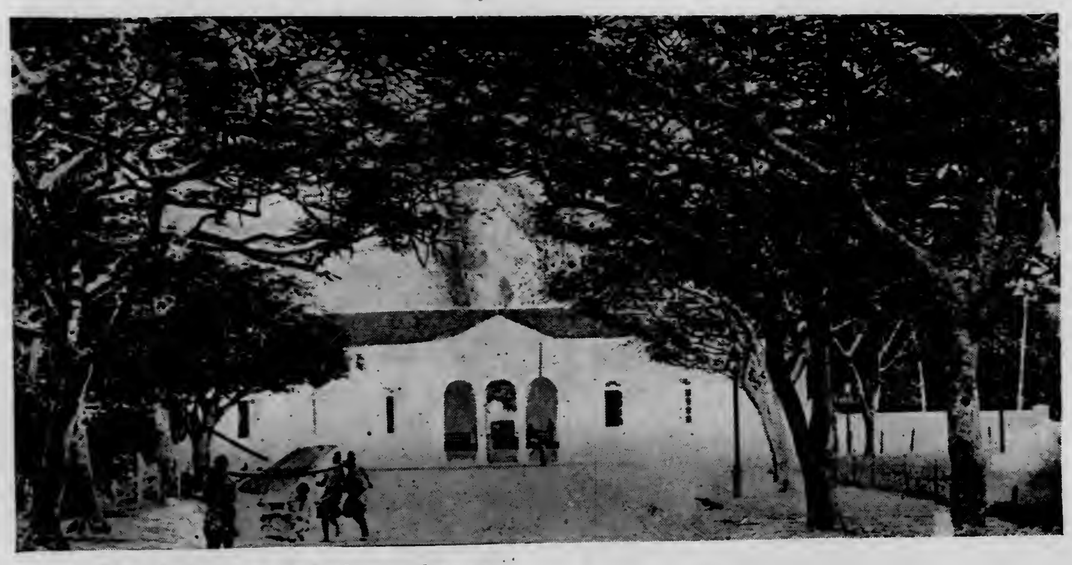
Between Inhambane and Beira the boat makes two stops, but very brief ones, at Bazaruto and Bartholomeu Dias. Bazaruto was once an Arab pearl fishery, later taken over by the Portuguese and now nearly exhausted. The headquarters are on a small, low island, little more than a large sand bar, easily seen in its entirety from the ship. In the center of the island are a few palms and casuarinas, and in such shade as they afford are the houses of the eight white men resident there. Bartholomeu Dias may become an important port as the country inland from it develops. Now it is very new, indeed, and seems to consist almost solely of a prison, a hospital and one residence.

No contrast could be greater than that between Inhambane and Beira. Inhambane, lovely as a dream, lies

in indolent beauty by the sea, ever overshadowed by the enchantment of the past. Beira, without romance and without a past, sprang into sudden, unsightly being at the call of commerce, a collection of miserable iron houses on a sand spit.

Beira is the terminus of the Mashonaland Railway and the natural port for Southern Rhodesia. Next to Lourenço Marques, it is the chief town of the Province. The streets are of loose sand, so deep as to make walking practically impossible, but on all of the principal ones good cement sidewalks have been laid. The customary method of going about the town is unique. A narrow track has been laid in the center of the streets, on which small cars can be pushed by native servants. Residents of Beira have their private cars. Larger cars, pushed by two or more boys, are used for carrying goods of various kinds. The present town of Beira has been built within the last thirty years. Until recently it was only an aggregation of the most unsightly buildings, almost every second one a bar. The riffraff of all countries drifted there when the railway was building and money came easily. In those days it was well described as a "sultry, sandy little Gehenna on the Indian Ocean" to which "every country from Japan to the Baltic seemed to have sent its worst." Now many improvements are being made, some substantial brick buildings have been put up for banks, stores and offices; there is a small and very feeble public garden, and palms and other trees are being planted along the streets. It is to be feared, however, that it will be many long years before the appropriateness of the name Beira, "sand," ceases to be unpleasantly obvious.

Scattered through the miles of cocoanut plantations beyond Inhambane are the neat, picturesque huts of the Kafirs, usually with a band of "picannins" in front of them



A machila being carried down the avenue of flamboyant trees that leads to the Governor's offices at Quelimane

The two days' sail from Beira to Quelimane is unbroken and monotonous. The heat becomes greater, and the food less appetizing and more hopelessly deluged with Portuguese oil. If by chance the stairs, in being lowered, have closed the one tiny port of the cabin, the officers cannot be induced to go to the trouble of having them moved away.

An Indian residence of Inhambane. This town, like many others along the coast, was first settled by eastern traders

The town of Quelimane lies some twelve miles above the mouth of the Quelimane River, or the "River of Good Intentions." Reaching the mouth of the river at dusk the boat slowly follows its course between the low, flat shores, covered with mangrove swamps. Against the evening sky is a ragged fringe of cocoanut palms. The town itself lies in darkness, merely the outlines of the houses and palms being visible by the first faint light of the rising moon. The whistle of the boat, however, wakens the little village to life. Dark forms are seen hurrying to the landing pier; there is a gleam of lanterns and one sees dimly several boats putting off from shore and soon comes the welcome sound of oars. The Governor's launch comes alongside and dapper Portuguese officials, in spick and span uniforms, come aboard.

Seen through the silvary enchantment of moonlight, Quelimane appears much like Inhambane, with low, square houses, and tall palms. With daylight, however, the impression is quite changed, and there seems more of difference than of similarity. We have been traveling steadily northward and are now well within the real tropics. The sky has grown an intenser blue, and all the colors, both of nature and of man's making, have grown correspondingly in intensity. The houses are again of the square, low, Portuguese type, and are built of plaster. Here they are painted in bright reds, blues, yellows and pinks, somewhat softened and subdued by the effects of sun and rain. Palms, wild fig trees, mangoes, bananas and high grass grow in profusion and furnish an abundance of green, but the one dominant color note of the picture is given by the *poinciana regia,* or flamboyant tree. This forms a large, well-proportioned tree and grows along both sides of all the principal streets. During four months of the year these flamboyant trees are one mass of vivid, flaming scarlet. One looks down streets, through long, overarched corridors, walled and roofed with scarlet and carpeted with the scarlet of fallen petals.

Quelimane lacks the delicate outlines and shadings of Inhambane. The latter seems to have the perfection of detail of some beautiful, carefully wrought miniature, or of an exquisite bit of carving. In Quelimane the artist seems to have dashed together all

Indian dhows on the Quelimane River. Indian and Arab traders first came to trade here centuries ago

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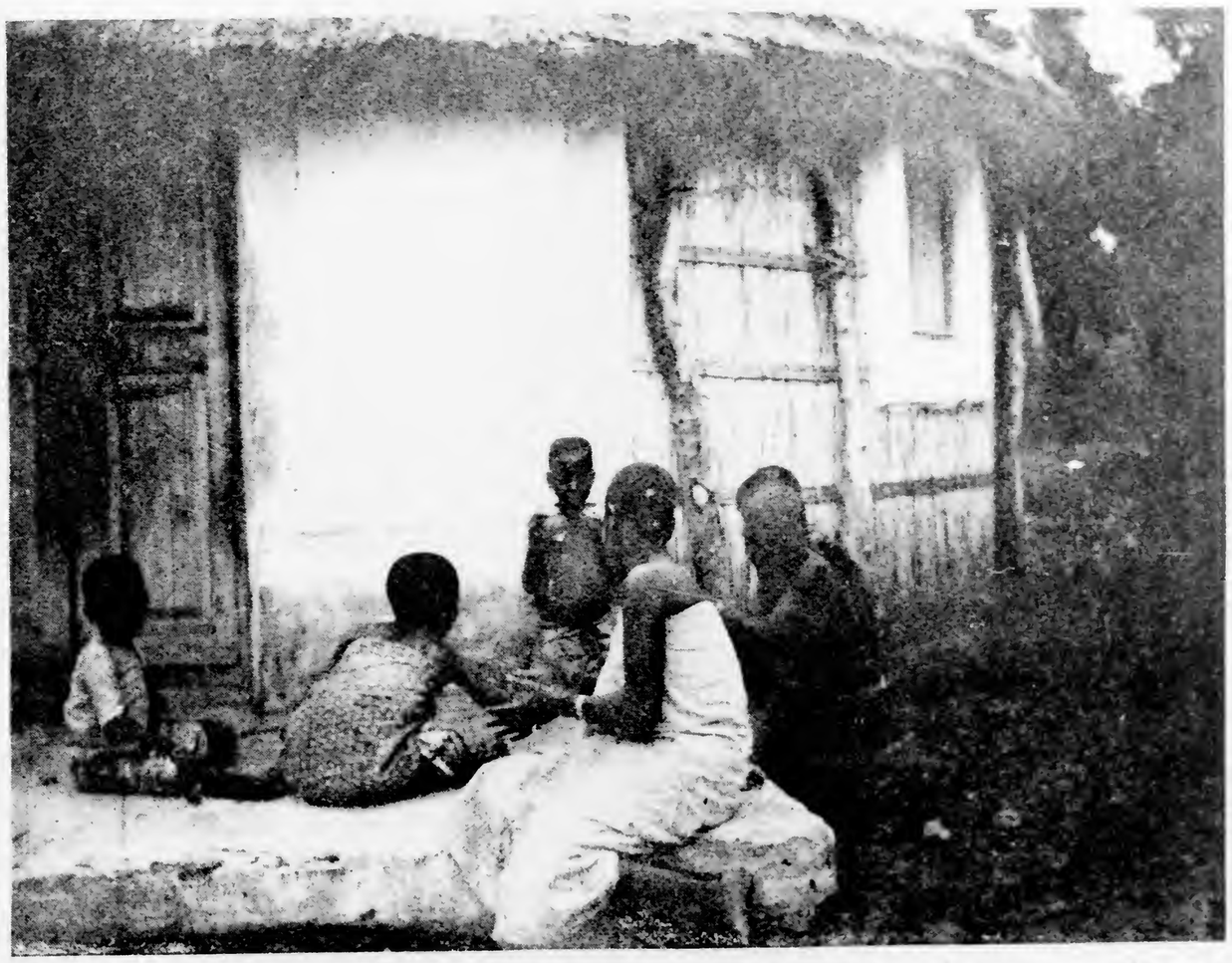

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In Quelimane we again find the three racial strands, but here they are woven together into a motley colored fabric. The extreme heat and the prevalence of malaria make the climate very difficult for Europeans. There are a very few Portuguese officials who attempt to keep their families with them for a part of the year. Other European nationalities have occasional representatives. The Eastern Telegraph Company keeps two or three young Englishmen at its station, but for short periods only, giving frequent changes to less trying climates. Many positions of trust and government offices are filled by Goanese Indians. The Goanese are often of mixed Portuguese and Indian descent, most of them are Catholics, and many have been well educated in Europe. These Indians are accepted on terms of social equality by the Portuguese.

Another class of Indians, abundant all along the East African Coast, is well represented at Quelimane. This is the Banyan, or trading caste. Some of the streets of Quelimane are almost wholly given over to their showy little shops, where every sort of cheap and gaudy article of clothing and adornment is offered to the native. There are also many Banyan tailors, often found sitting cross-legged on their porches, sewing rapidly and with entire concentration in the work of the moment.

The small European colony strives nobly to keep up a semblance of normal life. The late afternoon always finds a little group at the Governor's residence, drinking tea and playing tennis. A few of the more ambitious young men have started a golf course, where they can get a bit of exercise in the early morning, before the intense heat drives them within doors. Walking is an exercise little indulged in by the white man. There are few places where walking is pleasant, the streets being sandy and only the principal ones having cement sidewalks. Walking during the heat of the day would be exhausting, or even dangerous, and the universal custom is to have a machila, or hammock, strung on poles, and four Kafir boys to carry it. The machilas made for town use have a long, horizontal bottom with short, vertical end pieces, so that the occupant is able to get into a position halfway between lying and sitting. In the traveling machilas one lies down, and the swinging, jolting motion, to the rhythm of a Kafir song, grows monotonous and tiresome in the extreme when continued for several days in succession.

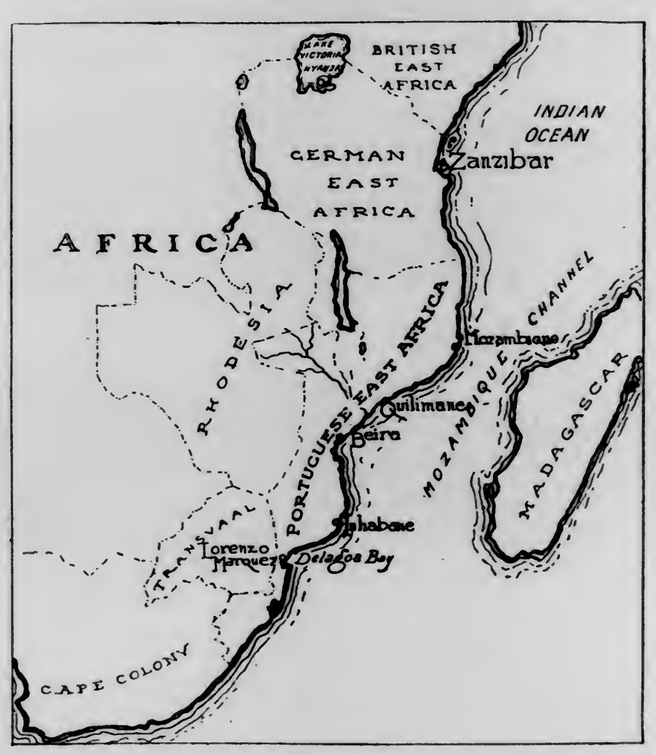
A scene on a cocoa plantation near Inhambane. The region is very fertile, but the climate makes other than native labor impossible

The natives around Quelimane are well built and intelligent. This is probably due to an admixture of Arab blood, as those farther inland are inferior in every respect. The local style of dress is most picturesque. The upper garment is a stockinet singlet, leaving the neck and arms bare, and usually striped in bright colors. A length of some cotton cloth, wide enough to reach as far as the knees, is then brought around the waist from behind, being held at the top by a belt. The end is brought between the legs and through the belt in front, falling in a sort of fan about halfway between the knees and ankles, and giving somewhat the effect of a Scotch kilt. The residents of Quelimane take the same pride in their machilas and machila boys that they would take in their carriages and horses in Europe. They choose tall, well-formed "machileiros," and have them dressed in uniform. For instance, a certain man might choose to have his boys wear singlets of navy and white stripes with red and white plaid cloths. His four boys would be perfectly matched in height, dressed in exactly the same style and, above all, scrupulously clean. The style of dress is cooler, more easily kept clean, and more becoming to the Kafir than ragged, discarded coats and trousers. The dark brown skin, clean and soft as satin, show off well in contrast to the bright colors of the cloths and singlets. The dress of the native women consists of a cloth about the waist and a larger, bright-colored cloth brought under the arms and fastened in front. There are 900,000 natives in the Quelimane District and not a single white soldier. That there is no unrest and no uprising speaks well for the government administration and the submissiveness of the natives.

KAFIRS ON THE WAY TO JOHANNESBURG

Every year hundreds of Kafirs are taken down the coast to work in the mines at Johannesburg. Most of the recruits are young men and boys, induced to leave home by gifts of dress and cheap jewelry

There are no records to tell us when the first settlement was made at Quelimane, but centuries ago the quaint Indian and Arab dhows, the counterparts of which may be seen to-day lying in Quelimane harbor, made their way across the Indian Ocean to the "Island of the Moon" and the coast of Africa, and many little stations were started for the barter of gold and ivory. On his memorable voyage to India in 1498. Vasco da Gama stopped at the little Arab town of Quelimane, and before many years Quelimane, like her sister towns, had passed from under the Star and Crescent to the flag of Portugal.



From the first all Portuguese expeditions to the African coast came with but two ends in view. Daring adventurers, clad in suits of mail, scorched by the tropical sun, and wasted by malignant fevers, sought to find the fabulous "gold of Ophir" and and the mythical Christian king, "Prester John." Side by side with these seekers for gold came the brave and zealous Jesuit Fathers, risking

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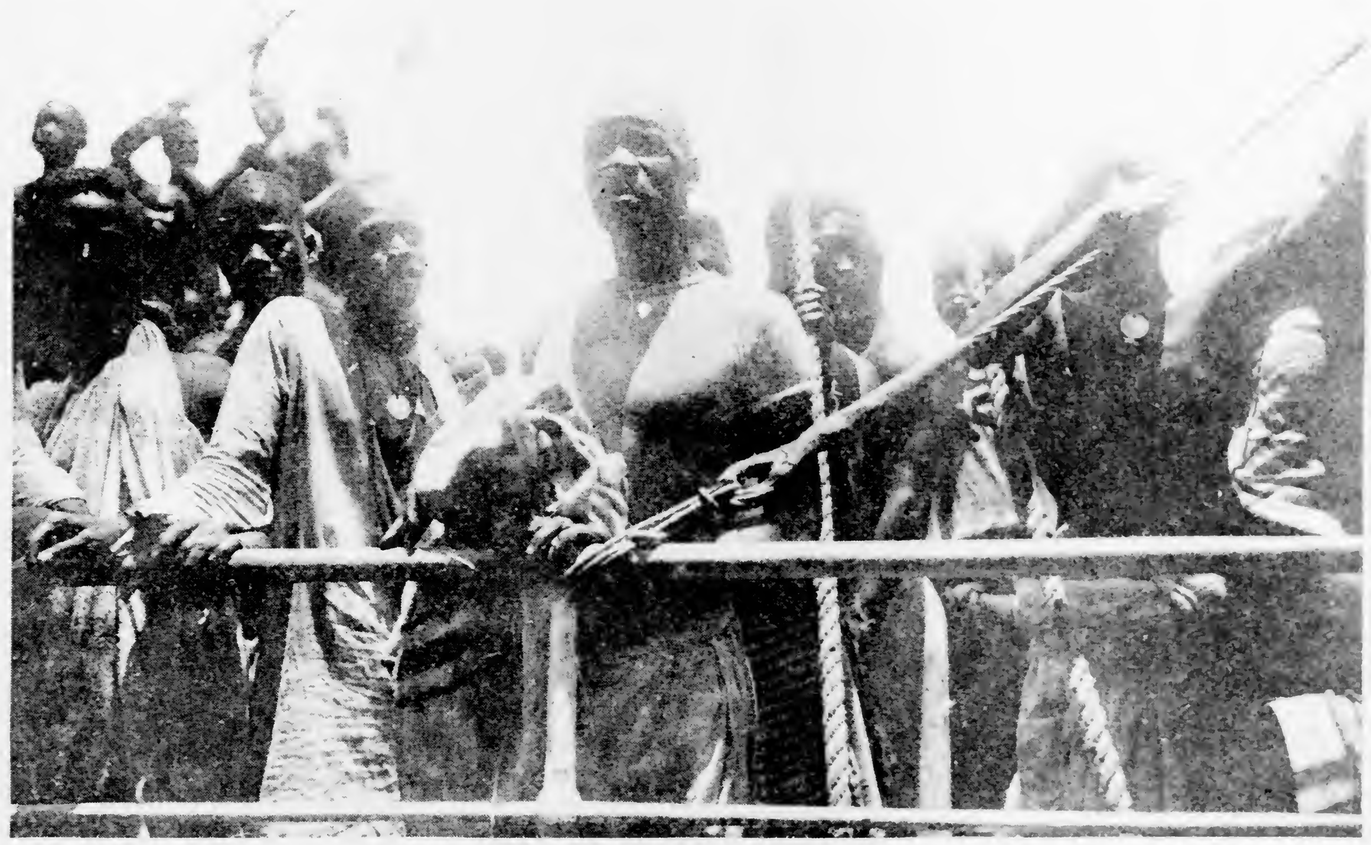

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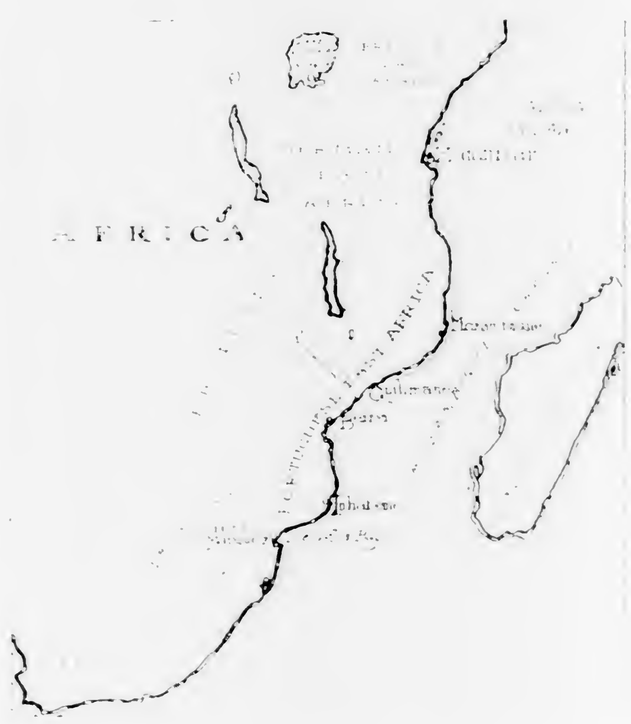

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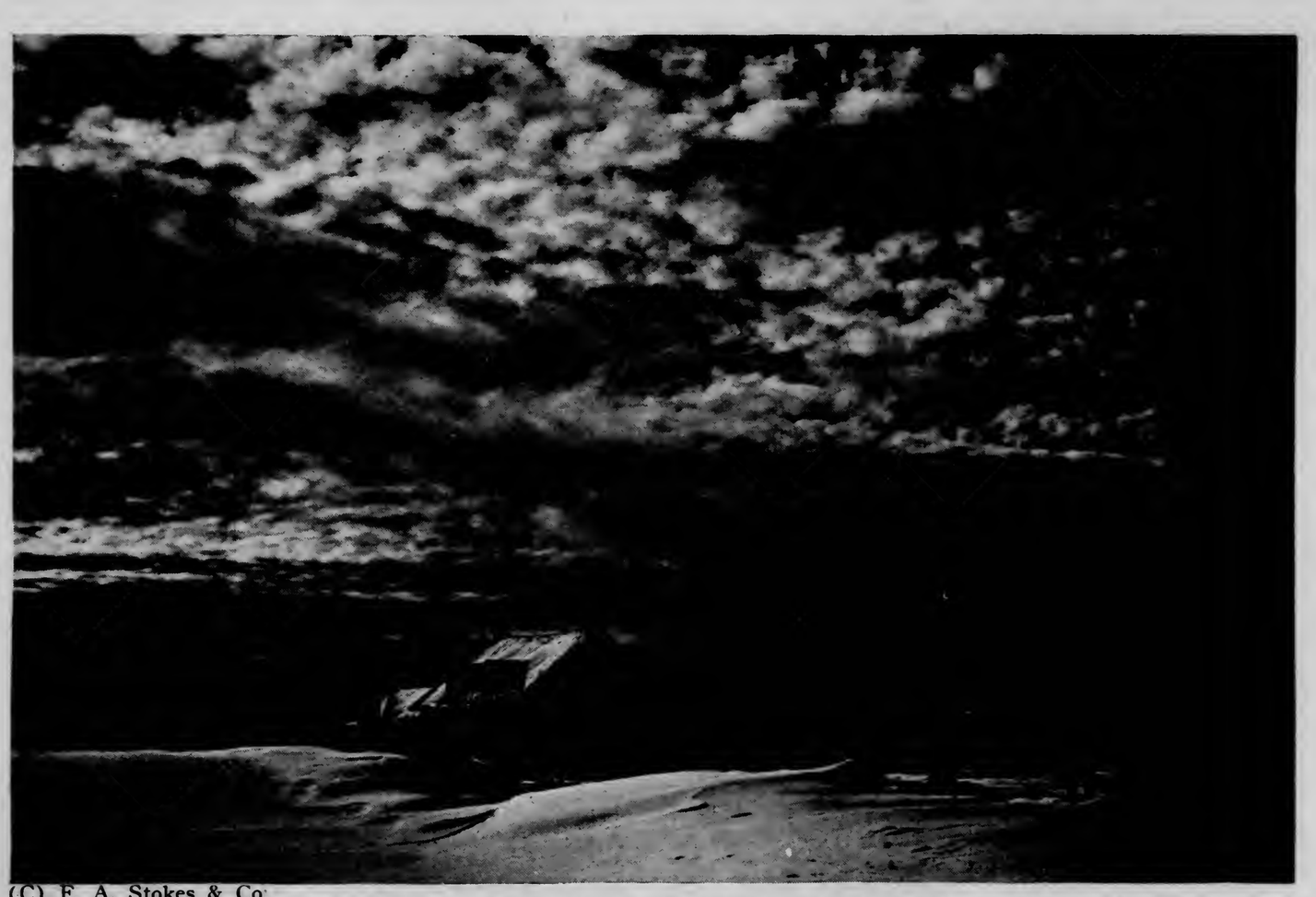

(C) F. A. Stokes & Co.

THE HOME OF A QUEBEC HABITANT

Here the party spent the first night of the journey. The owner was a typical French-Canadian farmer who retained the language, religion and customs of his French ancestors

ON RUNNERS TO MANOWAN

TRAVELING AS CARGO WITH A PORTAGE TEAM TO A HUDSON'S BAY POST—THE LIFE OF AN AGENT AT A FUR TRADING POST—THE PERSONALITY OF THE INDIAN TRAPPER

JULIAN A. DIMOCK

Photographs by the Author

THE sun was barely peeping over the eastern horizon as Watson and I, carrying sleeping bags and waterproof sacks, jumped off the train and tumbled into the waiting sleigh. Watson spoke a few words in French to the muffled figure on the front seat and received a grunt or two in reply as the driver whipped up his horse, after the manner of the men of Quebec. Before the train was out of the station we had started on our journey.

The runners of the cutter squeaked and the horses' hoofs rang out sharply on the frozen snow, for it was cold, very cold—the mercury registering 68 degrees below the freezing point. The keen wind cut to the quick and even furs failed to keep it out; but nothing could dampen my enthusiasm, for I was off on the winter trail at last. At the end of our journey lay a post of the Hudson's Bay Company.

The managers of the company of "Gentlemen Adventurers" are fully alive to changing conditions and they meet them at every point. As the railroads and the forward march of population encroaches upon the preserves of the trapper, the company meets them by establishing department stores, supplying towns with groceries, opening communication with their nearby posts by motor boats and taking up any other form of transportation that offers to cheapen costs. Long before the Grand Trunk Pacific considered pushing its way across Alberta, Saskatchewan and British Columbia, and before anyone else knew that wheat could be grown so far north, the Hudson's Bay Company was operating a mill near Fort Vermillion to supply its own posts with flour ground from the wheat grown in the immediate vicinity.

But to-day there are posts so remote that it is nine years from the time that supplies for them leave the London headquarters before the returns from the fur reach its coffers.

The army at work for the "Honorable Company" has in its ranks every caliber of worker, from the executive who spends much of his time in a well-furnished office to the Indian trapper who appears at some far-away post twice in a season. Once the aborigine comes to get supplies and again to bring in the fur caught through the trapping season. The factors themselves vary from the well-read man at the head of a chain of posts to the Indian whose accounts are kept by means of symbols and must need be interpreted by the man who made them. The trappers range from the primitive Indian who "makes fur" by tying a bit of fat to a bright new trap with a gaudy piece of string to the man who mixes brains with his craft and uses all the subtleties of the game. It is a contest worthy of wits, for the animals grow more and more wary as the years roll by.

Before we returned we had been out in really cold weather, but never have I suffered as on that first day. The further we got away from civilized methods of travel the less we felt the cold. Driving behind a dog team was warm by the side of that trip in

FOLLOWING THE TRAIL

The portage sleighs were mere platforms on runners, each drawn by a single horse. The trail led through virgin forests and over bleak hills that had been desolated by fire, and across frozen lakes smooth as the floor of a ballroom

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The managers of the company of "Gentlemen Adventurers" are fully alive to changing conditions and they meet them at every point. As the railroads and the forward march of population encroaches upon the preserves of the trapper, the company meets them by establishing department stores, supplying towns with groceries, opening communication with their nearby posts by motor boats and taking up any other form of transportation that offers to cheapen costs. Long before the Grand Trunk Pacific considered pushing its way across Alberta, Saskatchewan and British Columbia, and before anyone else knew that wheat could be grown so far north, the Hudson's Bay Company was operating a mill near Fort Vermilion to supply its own posts with flour ground from the wheat grown in the immediate vicinity.

But to-day there are posts so remote that it is nine years from the time that supplies for them leave the London headquarters before the returns from the fur reach its coffers.

The army at work for the "Honorable Company" has in its ranks every caliber of worker, from the executive who spends much of his time in a well-furnished office to the Indian trapper who appears at some far-away post twice in a season. Once the aborigine comes to get supplies and again to bring in the fur caught through the trapping season. The factors themselves vary from the well-read man at the head of a chain of posts to the Indian whose accounts are kept by means of symbols and must need be interpreted by the man who made them. The trappers range from the primitive Indian who "makes fur" by tying a bit of fat to a bright new trap with a gaudy piece of string to the man who mixes brains with his craft and uses all the subtleties of the game. It is a contest worthy of wits, for the animals grow more and more wary as the years roll by.

Before we returned we had been out in really cold weather, but never have I suffered as on that first day. The further we got away from civilized methods of travel the less we felt the cold. Driving behind a dog team was warm by the side of that trip in

FOLLOWING THE TRAIL

The portage sleighs were mere platforms on runners, each drawn by a single horse. The trail led through virgin forests and over bleak hills that had been desolated by fire, and across frozen lakes smooth as the floor of a ballroom

ALONG THE COAST OF PORTUGUESE AFRICA

(*Continued from page* 13)

perils on sea and pestilence on land for the hope of converting the heathen. The expeditions of the gold seekers ended again and again in pitiless defeat and disappointment, the labors of the missionaries in misunderstandings and martyrdom.

Thus centuries passed and the Portuguese did little more than hold a nominal title to the land. It is only within recent times that they have begun to realize its great agricultural resources. The low alluvial flats lying along the Zambesi and Quelimane rivers are rich and fertile. Near the coast rice and cocoanuts can be grown with profit, and farther inland cotton, sugar cane, groundnuts and sisal hemp. It is not, however, a country for the small individual farmer. The low-lying, marshy land can never be properly drained, and fever mosquitoes breed by myriads. These, together with the intense humid heat, make it a country impossible of settlement by the white race. It is only the large companies which can ever hope to make use of these rich resources. These companies have a few white managers, men who can make frequent changes to more healthful climates, and Indian overseers. With the introduction of modern methods and machinery the district is certain to have a great future agriculturally.

On our return from Quelimane we went up to Moçambique and changed to the mail boat, thus avoiding the discomforts of a longer voyage on a small boat. To our disappointment we came in at night and had only time to change to the big liner before she sailed, so that all we saw of that little town, the richest of all the coast towns in romantic lore and association, was a string of lights and the dark bulk of the old fort of San Sebastian, standing grim and forbidding as in the days when the gallant D'Ateide and his little band so bravely held their own against the great Dutch galleons.

The Governor of Quelimane and his wife, a French woman returning to Marseilles, and one or two Portuguese, were the only other first class passengers; but the lower decks, fore and aft, fairly swarmed with Kafirs, recruits for the mines at Johannesburg and the cocoa plantations of Sao Thomé—in all, perhaps a thousand. Most of these natives were young men, some mere boys, and all strong and vigorous. The recruiting agents have various devices for inducing the natives to leave their homes. Among the chief attractions are gifts of dress and cheap jewelry. A great agricultural difficulty in the Province is the fact that too many natives are recruited and not enough are left to supply the demands for labor on the plantations and farms. After a boy has worked for a few years in the mines, he often prefers to stay; or if he returns home it is with enough money to buy several wives and live in idleness the rest of his life.

The voyage down is a time of unalloyed happiness to the natives. They have new clothes of rainbow hue and many cheap but showy trinkets; they have plenty to eat and nothing to do but sleep, eat, sing and dance. Throughout almost the entire day and during a large part of the night the cargo of natives keeps up its strange dances. A ring of boys forms on one side of the deck. One boy goes into the center of the ring and performs a peculiar sort of dance, a combination of body and muscular torsions, and leaps and kicks, accompanying his dance with a chant, or with a narrative song explaining his gestures. The dance is often symbolic, a fantastic expression of some experience in private or tribal life. One dancer continues until he is tired out, then another takes his place in the circle, the crowd keeping time meanwhile with clapping hands and patting feet.

After four beautiful, cool, calm days, days of blue sky and bluer water, we come again in sight of the green banks and deep maroon bluff, "Ponta Vermelha," which marks the entrance to Lourenço Marques harbor. There is a final dinner on board, a sort of festive farewell, with a roast pig, bearing the flags of Portugal, America and France, as a center piece. As we come alongside the docks we hear the monotonous, ceaseless singing of natives working at the long line of ships, the half-weird, half-mournful song of Africa.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC.,

required by the Act of Congress of August 24, 1912, of TRAVEL, published monthly at New York, N. Y., for April 1, 1916.

State of New York, County of New York:

Before me, a Notary Public, in and for the State and county aforesaid, personally appeared Edward Frank Allen, who, having been duly sworn according to law, deposes and says that he is the editor of the TRAVEL and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit: That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Robert M. McBride & Co., 31 East 17th Street, New York; editor, Edward Frank Allen, 31 East 17th Street, New York; managing editor, Edward Frank Allen, 31 East 17th Street, New York; business managers, none. Owner: Robert M. McBride & Co., Inc., a corporation; Robert M. McBride, 31 East 17th Street, New York; Hampton Anderson, 31 East 17th Street, New York; Samuel McBride, 100 Lefferts Place, Brooklyn; Ernest Hall, 62 William Street, New York; Edna Brown Anderson, 1087 Boston Road, New York; Isaac H. Blanchard Company, 418 West 25th Street, New York. Stockholders in Isaac H. Blanchard Company: Isaac H. Blanchard, 108 High Street, East Orange, N. J.; Ancel J. Brower, 311 Rugby Road, Brooklyn, N. Y.; J. Cliff Blanchard, 15 Vernon Place, East Orange, N. J.

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(Signed) EDWARD FRANK ALLEN.

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JOHN T. ELSROAD, *Notary Public.*

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GUARDIAN OF THE GATES OF DAWN

This lion carved in granite was an object of temple worship in ancient Egypt and his cult was extensive throughout the kingdom in olden days

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A GODDESS OF FANTASTIC DESIGN

Thoueris, a strange deity, whose face was that both of crocodile and cow. She was, however, regarded as of little importance in the after-world

ANIMAL DEITIES OF ANCIENT EGYPT

BY RICHARD WRIGHT

PHOTOGRAPHS FROM HAMILTON M. WRIGHT

THE hundreds of American vacationists and scientists who annually visit Egypt are all greatly impressed by its vast store of archaeological subjects which include not only the world famous pyramids and scores of impressive temples but literally thousands of finely carved statues of gods and rulers made during the reign of the Pharaohs. A representative group of the best of these has recently been put on exhibition in the Cairo Museum at Cairo and will be seen this winter by all who visit Cairo, generally the first stopping place of travelers in the land of the Nile.

The early Egyptians humbly offered numerous sacrifices, often human, to their animal gods in the hope of either propitiating them or gaining their favor. The bul-

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STATUE OF THE GODDESS SEKHMET

One of the many interesting idols of an ancient day in Egypt now on exhibition in the Cairo Museum. In this goddess will be noted the influence of the eminence of the lion in Egyptian past since the goddess has the features of a proud lioness

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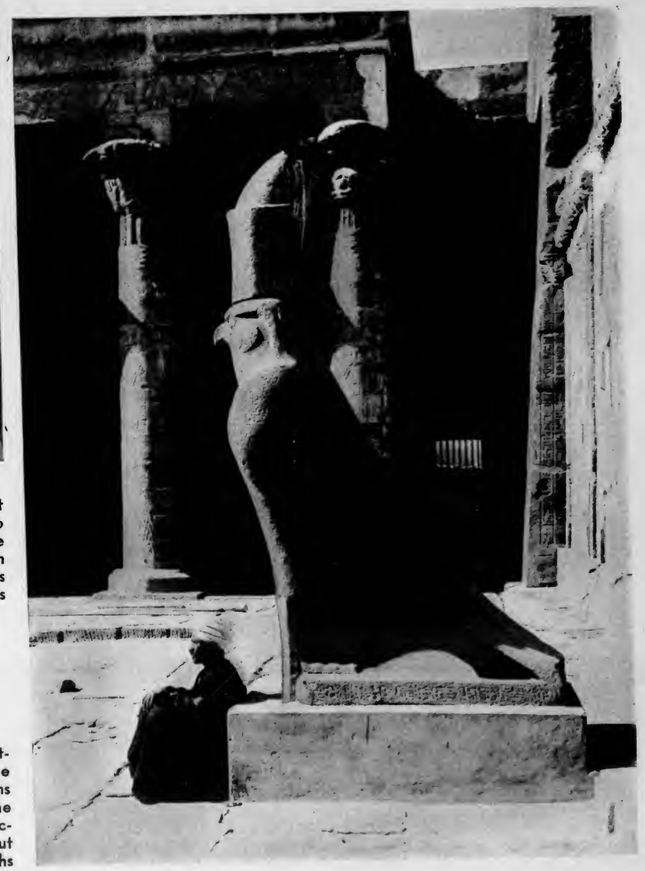
lock, without which agriculture in the rich Nile valley lands would have been impossible, was worshipped for his immense strength and virility. He became the principal god of Egypt. Other animals and birds, including the alligator, cat, cow, jackal, lion, and hawk, were venerated as gods of the highest order. At the height of Egyptian power and civilization animals were considered as being the incarnate form of a group of gods, the predecessors of the Egyptians in Egypt, and ordained to dwell in the after-world where every Egyptian hoped to go after death, and about them the Egyptians had built up a great store of religious legend. Flourishing cities existed along the Nile River valley from Cairo up the valley to Philæ in Nubia, 600 miles distant. They had been founded by various orders of Egyptian priests. Hieraconpolis, the Hawk-City, and Leontopolis, the Lion-City, were among the strongest of these religious centers. One may visit the well-preserved temples of several of these ancient communities today or see in the Cairo Museum the elaborately sculptured figures of the animal gods in whose honor the cities had been founded. The cow of Deir El Bahri in the Cairo Museum was considered sacred to Isis, the consort of Osiris, greatest of Egyptian gods and ruler of the sun, and also to Hathor, goddess of beauty, who lived in the underworld. This work, universally thought to be among the finest examples of Egyptian

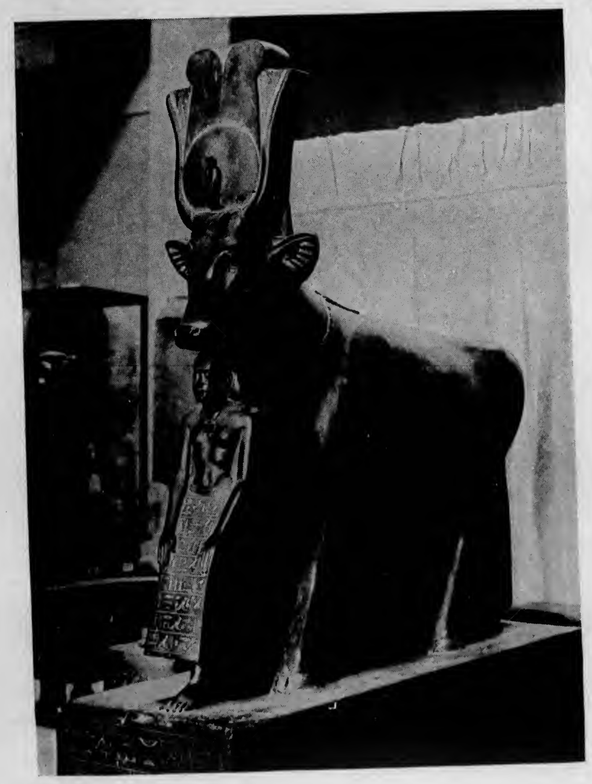


THE GREAT HAWK AT EDFOU, EGYPT

This statue of the crowned hawk stands outside the temple in this Egyptian city. The hawk was considered by early Egyptians to be the incarnate form of Horus, the son of Osiris, the sun god, and, accordingly, was the object of devout worship in the time of the Pharaohs

animal sculpture yet discovered, portrays an Egyptian sheltered by a sacred cow between whose horns rests the symbol of the sun. A bust of Anubis, jackal-faced god, constitutes one of the most interesting pieces of ancient statuary in the museum collection. Anubis was the god of the dead and the son of Osiris. His duties in the after-world were to conduct the spirits of dead Egyptians through the underworld to Osiris, the supreme judge of mortal good and evil in the trial of the dead.

In primitive times, before religious myth had grown up, Anubis was the jackal god and was regarded by the superstitious ancients to have associations with the deceased because jackals customarily prowled around tombs. It is a fact that worship of Anubis preceded worship of Osiris, who eventually was recognized throughout Egypt and other Mediterranean countries as the king of the gods. A sitting lion executed in granite with painstaking craftsmanship gives an impressive appearance to one of the hall stairways within the museum. The cult of the lion was an ancient one in Egypt. He was worshipped for his great strength not only by the priests of Leontopolis but in other municipalities in the empire as well. He was given special veneration because of his supposed association with the solar deities including Osiris, Horus and Ra, and, according to Egyptian mythology, he guarded the gate of dawn through which the sun god passed every morning. Lions were kept in numerous Egyptian temples by the priesthood who imagined that the gods indicated their desire to their children on earth by cer-



THE GUIDE OF THE DEAD

Anubis, the jackal-faced god, was believed by ancient Egyptians to be incarnate in the bodies of jackals who customarily prowled around tombs. According to Egyptian mythology, Anubis was the god of the dead and lived in the underworld through which he guided the souls of departed humans to the great court of final judgment, presided over by Osiris, ruler of the sun and king of the gods

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THE SACRED COW OF THE BEAUTIFUL

One of the finest specimens of Pharaonic sculpture, the cow of Deir El Bahri, considered by the ancient priests as being sacred to Isis, greatest of the Egyptian goddesses and of Osiris, god of the sun, and, also, to Hathor, goddess of beauty. The idol depicts an Egyptian seeking protection beneath its sheltering form. Between the cow's horns rests the symbol of the sun

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tain movements of the beast which the priests interpreted. In the great temple at Edfou, Egypt, stands a heroic sized statue of a crowned hawk, the type and symbol of the earliest Egyptian gods. The hawk was held to be an incarnate form of Horus, son of Osiris. Thoueris, a goddess with a face having the features of both crocodile and cow heads but relatively of little importance in the world of the gods, is another intriguing figure shown.

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AGRIMONY, LOPSEED AND AVENS
Reading from left to right. All three are about a fourth of an inch in length

BURS OF OUR COMMON PLANTS

BY SALOME COMSTOCK-MILLER

NO. 10—THREE ROADSIDE HITCH-HIKERS

ANOTHER trio of plant hitch-hikers that catch on our clothing and travel with us until we pry them loose are agrimony, avens, and lopseed.

Agrimony and avens belong to the rose family. The former is a hairy plant with a leaf usually composed of several pairs of leaflets. The yellow blossoms are arranged along a tall, many-flowered stalk. Each flower produces a quarter-inch bur which contains one or two seeds. The weed is rather well-known.

Avens or geum, as it is also called, produces from every flower a large number of small burs each having a single hook and each about a quarter-inch long. These are arranged in a spherical or oblong head with the hooks each pointing in a different direction. Sometimes the burs are found with an extra joint attached to the long slender hook, but this joint is frail and easily detached, so is seldom seen. The plant is abundant in woods and pastures and along roadsides.

Lopseed has a quaint little bur with three hooks attached at the end. It is produced by a rather frail plant growing from one to three feet high, and having broad, pointed leaves, undivided except for shallow notches on the edges. The flowers appear in pairs along the stem, which is often branched. Each blossom creates one bur, about a fourth of an inch in length, which contains a single seed. The plant seems to have been named lopseed because the burs lop down against the stem. It is found in woods and shady places. Look for the free-riders.

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HARD-SKINNED PUFFBALLS

BY DR. W. A. MURRILL

Another article in the group on the hard-skinned puffballs

NO. 2

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A HARD-SKINNED puffball that resembles the small-warted puffball in color, large rooted base and characteristic warts, the large earth-stars in the stellar shape assumed after the fruiting body splits at maturity, and the large puffball in the manner in which the fruiting body is buried in the soil, is frequently found south of New York.

It is the New Jersey hard-skinned puffball, *Scleroderma flavidum*. It has a somewhat flattened appearance, is between three and five centimeters in diameter, and holds to the soil by many yellowish rootlets. The skin is yellow, leathery, firm and finely warted. It is slightly wrinkled above, and smooth below. The interior soon becomes brown and powdery, and the spores are the same color with a wrinkled exterior.

This species was described and named by Mr. Ellis, the distinguished mycologist of Newfield, New Jersey, whose priceless collection of fungi is now at the New York Botanical Garden. I have not found this species in New York, but it appears to range from New Jersey southward. I have specimens from Texas and Wisconsin, also, indicating the range.

BREWING IN ANCIENT EGYPT

WITH nothing more before him than an Egyptian bottle that has been empty since 3300 B. C., Professor Dr. Johannes Gruess, of Berlin, can tell whether the departed Pharaoh in whose tomb it was found liked his beer light or dark, whether he favored a brew made of barley or emmer, or whether his taste ran more daintily to wine. Fortunately for themselves and their subjects as well, distilled liquors were unknown to the kings of ancient Egypt.

It all turns on Professor Gruess' expert knowledge of yeasts. There are many different species of these active microscopic plants that put the kick in home-brew and raise the dough when the baker makes bread, and only a botanist specially trained in microscopic technique can tell them apart.

Professor Gruess had a lot of ancient bottles and jugs which had been sent to him by Dr. H. E. Winlock, of the Metropolitan Museum of Art in New York. They had been found in various ancient tombs, some of them dating back 1700 years beyond King Tut. They had been full of various fermented liquids, but these of course had evaporated, leaving a deposit of dried yeast cells and other detritus on their sides and bottoms.

By microscopic examination of this material, Professor Gruess was able to tell what the Pharaoh's brewer had used. The special kind of beer could be determined from starch grains mixed with the yeast deposit, and wines were betrayed by the presence of characteristic acid crystals. That one batch of beer had gone sour was indicated by the finding of the skins of a number of "vinegar eels."

Early Egyptian brewers and winemakers were not at all fussy. Apparently they didn't even take the trouble to strain the water they used; for Professor Gruess has found, mixed with his yeast cells, such things as tiny twigs and leaf fragments, bits of water weeds from the Nile, and wings, legs and heads of insects of various kinds, to say nothing of appreciable amounts of desert dust.

About one thing, however, they were particular. They always used the same kind of yeast, and they apparently kept their cultures pure for over 2,000 years. The elaborate ceremonies of the Hebrew purging and renewal of the leaven at Pesach give a hint of how yeast may have been cared for in old Egypt.

Professor Gruess identifies the old Egyptian yeast as a wild species that lives on certain fruits, though he regards it as more likely that it went into the Egyptian "makings" with honey that was added to the batch as sugar is added by present-day home-brewers. He regards it as a new species of *Saccharomyces*, the genus to which all yeasts belong, and in honor of the American who supplied him with his ancient bottles he has named the yeast *Saccharomyces Winlocki*.

Science Supplement. Nov. 8, 1931.

"We postulate the existence of the gene because of the properties it gives to aggregates of other matter," Drs. Gowen and Gay explained. "Size is a fundamental structural characteristic. The measurement of size, even though it may be crude, has, if we may judge by our sister sciences, always led to further progress."

The Rockefeller investigators based their discovery of the gene's size upon the discovery made several years ago that x-rays will smash into genes and change the bodily characteristics that they transmit. They used the drosophila fruit flies that have been experimented upon to contribute so much to the new knowledge of heredity obtained since the turn of the century. Pure x-rays specially produced were used to bring about the changes in genes that are known as mutations. Thousands of flies were used in the experiments. The magnitude of the average gene was found by dividing the amount of chromatin, or material in the chromosome, by the number of genes estimated by the mutations observed.

The total number of genes in any one cell was shown to be not less than fourteen thousand three hundred eighty. This corresponded to a largest gene size expressed numerically in cubic centimeters as one tenth visualize this extremely small volume, one quintillionth multiplied by itself eighteen times. In attempting to of a cubic centimeter, it may be helpful to remember that a centimeter is a little more than a third of an inch.

These gene size determinations check approximately with those reported several months ago by Professor Oswald Blackwood, of the University of Pittsburgh.—WATSON DAVIS.

KING TUT'S PURPLE GOLD

BEAUTIFUL purple surface films on golden sequins found in the tomb of Tut-Ankh-Amen have been proved to be due to the presence of iron in the gold, by Professor R. W. Wood, of the Johns Hopkins University. Professor Wood reported on his examination of these ancient ornaments before the American Association for the Advancement of Science.

The sequins have been the subject of much discussion ever since they were first discovered. Some investigators have claimed that the Egyptians knew an art for coloring gold surface purple, while others have believed that the purple sheen was a kind of patina due to the great age of the ornaments. Professor Wood, using the methods of a physicist, has shown the color to be due merely to the presence of iron in gold which has been first hammered and then heated. He even made duplicates of the sequins by hammering out a gold-iron alloy into thin flakes and heating the latter over a flame. One of his modern purple-gold sequins has been sent to the Cairo Museum, to be displayed along with the originals.

A modern beauty aid helped in the solution of the riddle of the purple film. Professor Wood found he could remove the film by coating the gold ornaments with celluloid varnish such as is used in fingernail polish, and then peeling off the varnish, leaving the underlying gold of a bright yellow color. There was no sign of the film on the peeled-off varnish layer, but the film could be made to reappear by redepositing gold on the side to which the film was attached by vaporizing gold in a vacuum. Then the purple could again be seen by reflected light. The problem in physical optics presented by this phenomenon is still under examination.

Subjected to spectroscopic examination, the stripped-off film proved to be principally iron, probably an iron oxide. Professor Wood then suspended one of the sequins from which the purple film had been removed between the poles of a strong electromagnet. It was attracted toward one of the poles, demonstrating the presence of iron in the gold.

Etching the surface of the gold with acid showed a very marked crystalline structure, such as is found only when rolled or hammered sheet gold is subsequently heated to nearly a red heat. Microscopic examination showed on the surface numerous small globules of gold standing out in high relief, conclusive evidence that the sequins had been heated to a high temperature after having been hammered into shape. It was after having learned these facts that Professor Wood took gold and iron and duplicated the product of the "lost art" of the ancient Egyptian court jewelers.

The microscopic globules Professor Wood believes to be due to melting of the gold out of a gold-orpiment mixture experimentally tried by the Egyptian artist. Orpiment is a bright yellow arsenic-sulphur compound known to the Egyptians and used by them in tomb wall decorations. Lumps of it were found in Tut-Ankh-Amen's tomb, some of which Professor Wood received from the Cairo authorities.

Melting gold with this orpiment, and rolling the resulting bead out into a plate, Professor Wood heated it over a flame and obtained gold globules exactly like those on the sequins. He also hammered out small nuggets of California gold, which had been in his family since '49, and on heating the resulting plates he again obtained the globules. No purple film appeared, however, for the California gold is free from iron.

MOTION PICTURES OF THE GROWTH OF NERVE FIBERS

MOTION pictures demonstrating how nerve fibers grow through living tissue, and how they repair themselves when injured, were shown before the meeting of the American Association for the Advancement of Science by Professor Carl C. Speidel, of the University of Virginia. Professor Speidel was the winner of the Association's $1,000 prize at the midwinter meeting at New Orleans last year, and the report he rendered constituted a summary of his work up to that time and of advances made since then.

As pictured and explained by Professor Speidel, nerve growth is pioneered by what are known as "growth cones" on the ends of the nerve fibers. These are thickenings of the tips, which probe their way through the tissues, constantly sending out and retracting tiny processes from their surfaces, like finger-tips feeling their way. As the nerve progresses, special cells develop

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April 1927.

BARLEY IN EGYPT BEFORE WHEAT

THE evidence for the use of barley by the early Egyptians of the pre-dynastic period is summarized by G. Elliott Smith, in *Nature* of January 15, 1927, in a communication entitled "The Beginning of Agriculture."

Referring to the investigation of an early pre-dynastic site in 1901 Professor Smith says, "I recovered from the alimentary canals of a large number of bodies the food that these people had consumed about sixty centuries ago." The study of this material by German specialists in pharmacognosy did not reach a definite conclusion till 1921. The diagnosis of wheat could not be established in a single case, "whereas there is ample evidence that barley was present in most of the specimens." The discovery is recognized as "of extraordinary interest and importance for it definitely establishes the fact that the pre-dynastic people did not eat wheat. The number of specimens is so great that such an assertion can be made with complete confidence. The earliest example of *Triticum dicoccum* appears to be that found by Borchardt in the foundation at the west end of the offering-granary in the temple of King Sahure of the fifth dynasty. Dr. Cherry and others have pointed out, however, that it may have been in use in earier dynastic times."

Accordingly the culture of barley is claimed as the beginning of agriculture, on the strength of recent archaeological indications that the remains of the early pre-dynastic period of Egypt are older than any remnants of ancient civilization in the valley of the Euphrates. This is thought to establish definitely the priority of Egypt as the exclusive center of early civilization.

If, then, the early pre-dynastic evidence reveals the presence of cereals and suggests that agriculture was then being practiced, we have positive evidence of the most significant kind that civilization began in Egypt. We know also that people in Egypt at this time, many centuries before the metal copper was known, were using the copper ore malachite, which there is every reason for believing was obtained from the Wady Alaqi in Nubia. These and scores of other facts to which I have been constantly directing attention, in season and out of season, during the last fifteen years, establish on a firm foundation the certainty that civilization, not merely agriculture and the working of metals, customs and beliefs that go to the making of early civilization, were first invented in the Nile Valley.

The fact that the alimentary canals of all those earliest Egyptians contained barley is surely certain evidence that barley was growing in Egypt at that time. Whether it was indigenous or not we have, of course, no direct evidence to prove, because every foot of land that can be cultivated in the Nile Valley has been turned over countless millions of times during the last sixty centuries by an unbroken series of *fellahin*. But the fact that wild barley is found in the northeast corner of Africa, both on the Mediterranean littoral and in the regions to the south and east of Egypt, suggests that it was also growing in the Nile Valley when men first made their way into that strip of land.

The only alternative is to assume that the earliest Egyptians brought barley into the country with them. I need scarcely say that this is a mere speculation, in support of which there is no evidence of any sort, not even a suggestion of its likelihood. The conclusion that is forced upon us is that the earliest settlers in the Nile Valley found barley growing there in a wild state and made use of this natural food supply. Living under such ideal conditions, the population, in course of time, increased to such an extent that the natural supply was inadequate to support them. Then it can be assumed men imitated the natural processes which they had watched year by year for unknown centuries, and by extending the area of irrigation instantly devised the art of irrigation and the invention of agriculture. This is the only reasonable interpretation of a vast mass of evidence.

A different line of argument could be projected, of course, from the indications that wheat was brought into Egypt by the dynastic people who were more advanced than the pre-dynastic Egyptians. Since it is known that the dynastic people came into up-

per Egypt from the East and brought a higher civilization with them, a source of civilization outside of Egypt is indicated. The priority of Egypt is open to question, even on archaeological grounds. Biological objections to considering the Nile Valley as an original seat of agriculture or center of plant domestication are stated in a recent article in this JOURNAL on "Peru as a Center of Domestication."*

Instead of accepting the Nile Valley as the original home or place of development of the wild barley, it seems more probable that the natural condition of the overflowed lands was that of a tropical swamp with watercourses blocked by papyrus, and inhabited by crocodiles and hippopotami. Agriculture may have had several beginnings, but if there was only one beginning it probably was not in Egypt, but is more likely to have been in Peru.

The ancient monuments of Egypt with the changeless climate and sixty centuries of *fellahin* in "an unbroken series," convey, even to the scientific investigator, an almost superstitious veneration of antiquity. But this feeling must be shaken off, or at least held in suspense, if there is to be any real biological study of the problems of early development of civilization, as based on agriculture. The time for any scientific certainty probably is far in the future. Only a few of our present day investigators and writers on primitive civilizations recognize the relation to agriculture or appreciate the biological factors of the agricultural problems. Indications of longer domestication of plants in America than in the "Old World" have received little consideration from Egyptologists and Assyriologists.

The way of such knowledge has many strange pitfalls where mistakes are so easily made even in matters that seem obvious and self-evident to Professor Smith. Thus the eating of barley by the prehistoric Egyptians does not *prove* the growing of barley, and the growing of barley would not *prove* the domestication of barley, at a particular place or by a particular people. The wild species of barley are numerous and widely distributed in the Mediterranean region and in Western Asia, and might have been domesticated in any part of their natural range, or they might have been used without being cultivated. The wild rice of eastern North America, *Zizania aquatica,* was an important food product among many tribes of Indians but was not cultivated. Many tribes of Indians in California had no agriculture, but regularly harvested and stored the seed of grasses and other plants, for grinding into meal.

Any biological fact like the sequence of barley and wheat in Egypt is likely to be significant, and it is interesting to consider what each fact may mean. Speculations that arouse interest and stimulate further study are useful, but too many inferences from one fact weaken confidence in our procedure, and tend to obscure the facts rather than to clarify their relations.

O. F. Cook.

*COOK, O. F. Peru as a Center of Domestication, *Journal of Heredity,* Vol. XVI, Nos. 2 and 3, pp. 33-47, 95-110.

———— Wild Wheat in Palestine, *U. S. Dept. Agr. Bull. No.* 274, Jan. 21, 1913.

———— Milpa Agriculture a Primitive Tropical System, Smithsonian Report for 1919, pp. 307-326.

See also two interesting short communications by John Percival and Harold J. E. Peake in *Nature* of January 29, 1927, discussing Professor Smith's article on "The Beginning of Agriculture," and pointing out that emmer and *turgidum* wheats have been found in many ancient sites in Egypt, while the *vulgare* wheats are believed not to have appeared in Egypt until Roman times.

Africa: Pygmies

C. Hart Merriam
Papers
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NATURAL HISTORY

November, 1934

Wings Over Africa

by
Martin Johnson

An account of a photographic expedition that traveled by airplane through 60,000 miles of African sky

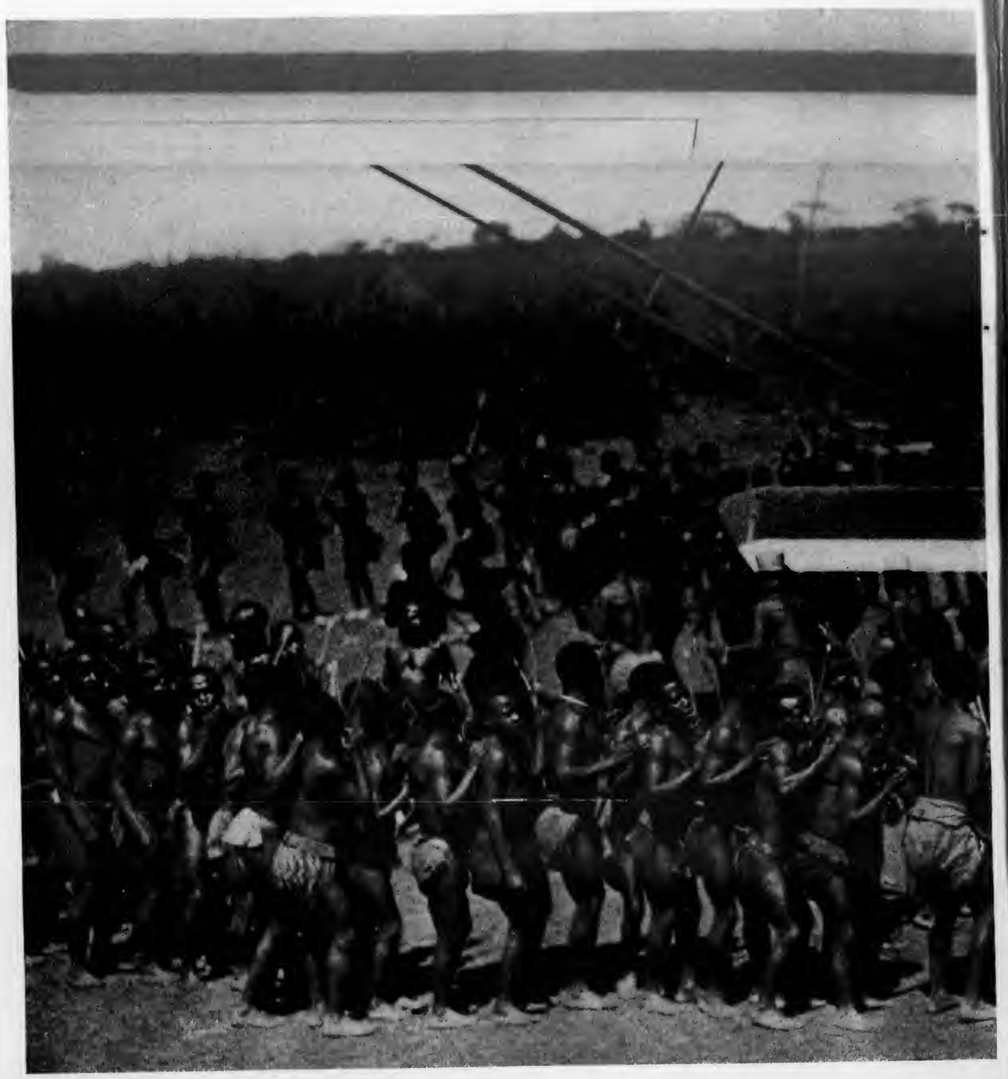
HAD I been told, three years ago, that on our next expedition to Africa we would fly our own airplanes for 60,000 miles over the jungles and lakes and plains of the once "dark" continent, I would have been convinced that my informant was mad. Yet that is what happened, despite the fact that until so short a time ago I had what I imagined to be a definite and deep-seated aversion to flying.

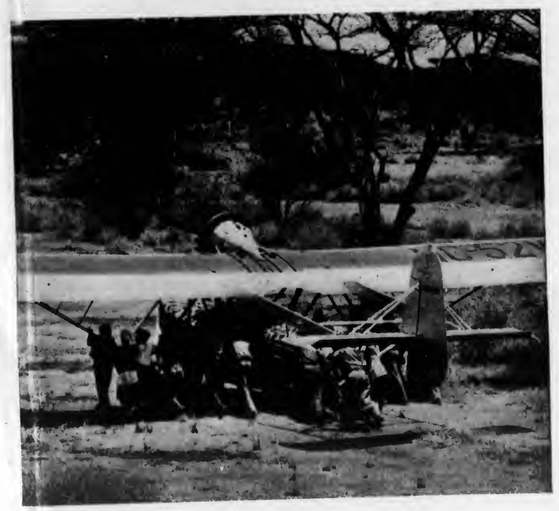
My change of mind came about quite unexpectedly. Called to Kansas from New York by the serious illness of my father, I went by the quickest possible route—which was, of course, by air. So expeditious was this means of travel, and so simple and pleasant, that I found myself keenly interested in a subject which theretofore I had never imagined would appeal to me. My next step was to learn to fly, and, after that, to talk Osa (my wife) into learning. Even yet, however, we had no idea of purchasing planes for use in Africa. But then, on a visit to Bridgeport, Connecticut, we went out to the Sikorsky plant, as a matter of curiosity, and, though we did not realize it at the time, we saw the planes we ultimately took with us.

Weeks passed before we really admitted to ourselves that we wanted them, but as I look back now, I see plainly that the die was cast on the occasion of that first visit to the Sikorsky factory. At any rate, when we sailed from New York, in December, 1932, for Cape Town, we had with us on the ship two Sikorsky amphibians by means of which we were determined to carry our expedition supplies and ourselves first from Cape Town to Nairobi, and from there to many interesting spots in the outlying districts that theretofore had been, very often, so hard, or even impossible, to reach in the time at our disposal and with the equipment that our task required.

There were eight in our original party, for photographic expeditions have grown more complicated for other reasons besides the addition of airplanes. Had I been forced, for instance, when I first started to handle the crank of a motion picture camera, to learn the complexities of "sound equipment" as well, I might—and with reason—have considered the matter beyond me and turned to simpler pursuits. But having fairly well mastered "cinematography" before sound photography was added to an already reasonably complicated procedure, I merely buckled down and attained a fair understanding of this newer and more complicated business. But now, as if motion picture cameras and sound equipment were not enough, I was adding aviation for good measure.

Nevertheless, cameras, sound apparatus, and airplanes together are a little too much for two people to handle satisfactorily, and while Osa and I, on our earlier expeditions, have gone into the field with no assistance beyond what our native "boys" could be



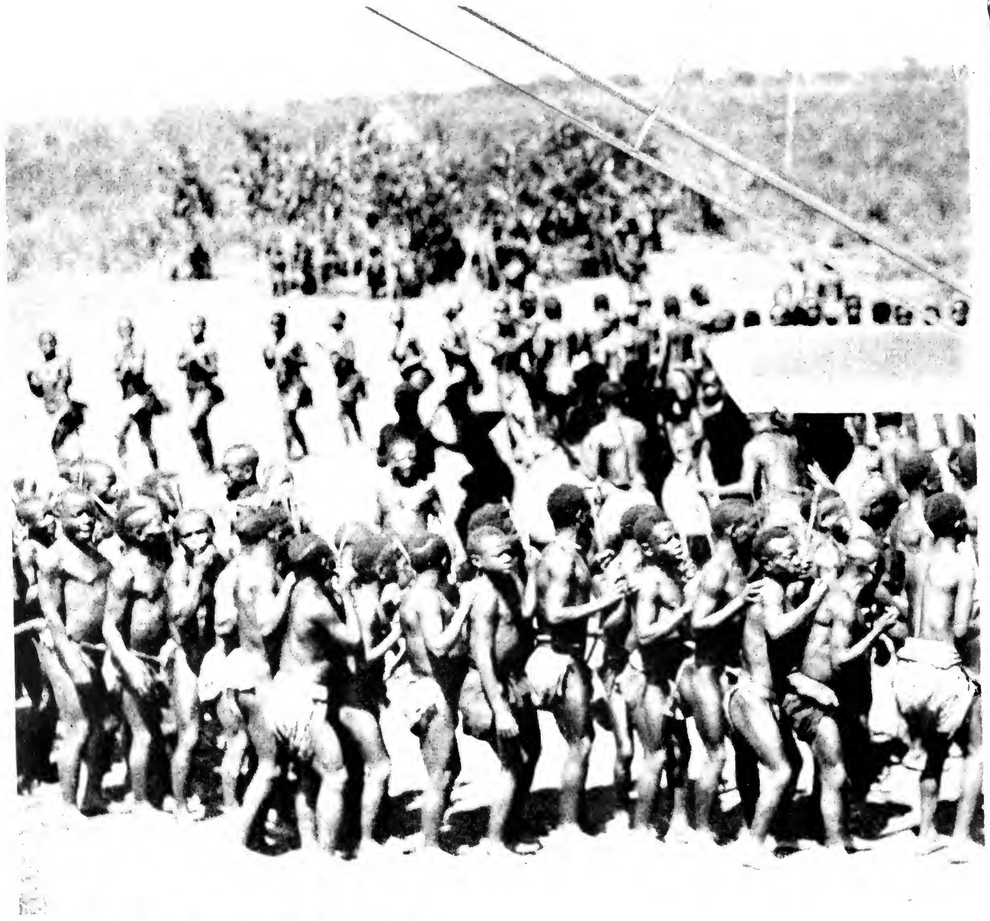


Airplanes

The large photograph shows part of an assemblage of pygmies in an opening in the Ituri Forest, as they danced around the Johnsons' plane —the first that they had ever seen. Thirty-six of these little people were taken up at one time in the big "ship." The picture at the lower

and Natives

left shows the plane after it had landed in a narrow opening among the trees, where careful handling was necessary both in landing and in taking off. The picture at the lower right was taken in the Kaisoot Desert, among the Somali people who examined it with interest



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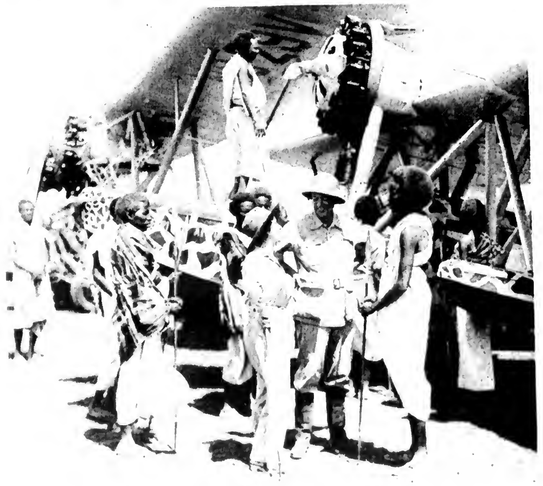

depended upon to deliver, we now required two competent pilots, and two men equally competent to handle the sound apparatus. The result was that in addition to Osa and myself our party also included Boris Sergievsky and Vern Carstens, our pilots, and A. J. Sanial and Robert Moreno, our sound engineers. As a matter of fact, there were others as well, though some were scheduled to go only as far as East Africa. Boris Sergievsky, for instance, had other contracts to fulfill, while Al Monvay, our mechanic, had to return to the Sikorsky factory, and Arthur Sanial had to return to the United States to carry on his work in "sound" engineering. But when our planes had been assembled in Cape Town and took off from the ample waters of Table Bay, we formed a party of considerable dimensions.

Plans

I am invariably asked, before we start on any expedition, just what our plans are. The truth of the matter is that detailed plans are rarely on our calendar. Our purpose is to make the best possible motion pictures of animals and natives, and in order to do that we have long since learned that we must take advantage of conditions as we find them.

Consequently, almost our only main purpose on our last expedition was to be prepared, both with equipment and with transport, to do this although, with planes at our disposal, we did look forward to visiting Lake Rudolf, an immense body of water which extends from Abyssinia far into the northern part of Kenya Colony.

But it is necessary to say that our purpose never was to photograph animals from the air. Effective animal pictures must be from reasonably short distances, and, too, they must, for the most part, show undisturbed and comparatively tranquil scenes. These cannot be obtained from the air. But airplanes are useful in looking over the land, and they make possible the most remarkable speed in a land so largely devoid of roads.

But we did more than use our planes as means of transportation. With fixed camps, where repairs could be made and where supplies could be kept, we often sailed off "into the blue" with our planes so equipped that we lived aboard as comfortably as if we had been on a motor cruiser or a small yacht. Then, with the larger of the two (it is a 10-place plane) as the "houseboat," and the smaller 5-passenger plane with which to do our "scouting," we had no need to pitch camps or to go equipped with all of the paraphernalia that the usual safari requires. For a few days we were thus able to live in perfect comfort hundreds of miles away from our base camps. Both planes, being amphibians, can land either on the plains or on the rivers and lakes, though often we had to fly back and forth over our chosen landing places many times in order to clear the place of animals among which we might otherwise have had a rough, or even a calamitous, landing. The ponderous back of a hippopotamus or a crocodile in a lake or a river offers all the elements of danger to landing that a rock might offer, with a few others thrown in for good measure, and a beautifully level section of the plains is literally filled with possibilities of unfortunate landings if antelope and zebra and giraffe abound. Thus a certain amount of care is necessary in order to eliminate a danger that is not so often found elsewhere in the world. It is only fair to our planes and to Vern Carstens, however (and incidentally to Mrs. Johnson and myself, for we flew the planes ourselves more than a little), to say that in our sixty thousand miles of African flying, during which we landed in scores and scores of unprepared spots, not once did we have any difficulty that even remotely suggested a "crack-up."

It was interesting, too, to see the result of landing a huge and roaring plane near some native village to which, theretofore, an airplane had been a thing unknown. To expect them to show keen interest or even fear was, I suppose, natural enough. But to come down, as we did, quite unexpectedly on Lake Rudolf, and to be received, and even aided, by natives to whom airplanes were utterly

In Camp

Ready for a Flight

The Johnsons' planes are shown parked at a camp on the side of Mt. Kenya, ready to take off for a flight in any direction on the receipt of news from the natives of the movements of game

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Mountain, Lake, and Plain

Left: Mt. Kenya among the clouds, as it appeared from an altitude of 18,000 feet. So rarefied was the air at this height that even the winding of a spring-driven camera left Mr. Johnson almost exhausted

Below: Landing a plane in a Kikuya village. Immediately after this picture was taken, one of the huts collapsed, due to the fact that too many of these frightened natives chose it as a shelter

Right: The rugged, barren shores of Lake Rudolf, a most dangerous region in the event of a forced landing

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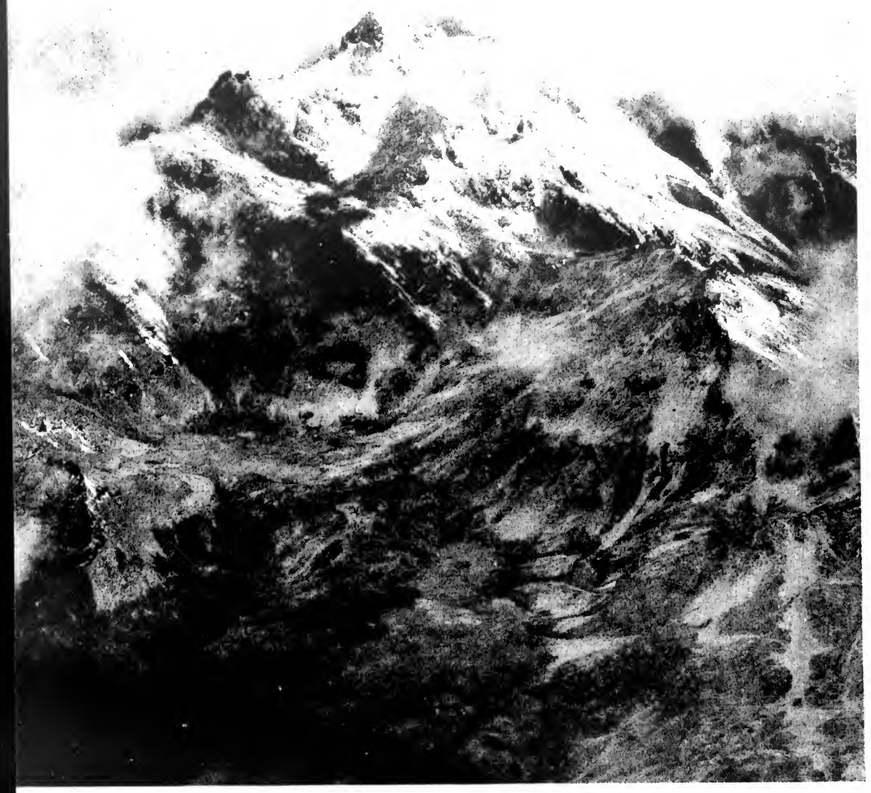

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unheard of, and then to see that they paid absolutely no attention to the great planes, which were the most apparent objects in sight, was, I must admit, a surprise to me. In one place, where there were no trees and where no shade gave relief from the broiling sun, these natives crouched in the shade of the wings when we had beached the plane, and showed not the slightest interest, otherwise, in it. Even when Vern Carstens took the plane up and circled over our heads these strange Turkanas did not so much as look up to watch him as he flew.

Yet, on another occasion, we took up thirty-six pygmies while we were on a visit to the Ituri Forest, in the Belgian Congo, and a more delighted and highly pleased group I never saw.

Pygmies in an Airplane

Since my first visit to the pygmy country six or seven years ago I have been a great admirer of these delightful little people. In the twenty years or more that Osa and I have spent so largely among savage and primitive peoples, I never have come across more likeable natives than these little fellows of the Ituri Forest, and it was with more than a little interest that I looked forward to introducing them to our airplanes.

We sent a party ahead in order to have a landing field prepared in a clearing we remembered, and when we had given them time to reach the place, and to remove the ant hills and other obstructions to landing, we followed. The signals that were set out for us told us the field was ready for our reception and we landed without the slightest difficulty, to find almost two hundred pygmies awaiting us.

We had only a few days at our disposal, and I set about inviting a group of the little people to take a flight with us, but my invitation failed. They did not refuse, but neither did they accept, each of them smiling and shrugging his shoulders, suggesting by signs that his nearest neighbor was a likely prospect. So presently I gave up the invitation method, and proceeded to round up a group, directing them into the plane.

The chief and his wife definitely refused to go, but I managed to include two of their children—tiny little girls about fifteen years of age. They were especially bright little things, and I wanted them in the party. Neither of their parents seemed overly delighted, but neither did they object, so, with the cabin literally alive with the excited little people, we took off.

Never have I seen a more delighted crowd. They jabbered constantly, and pointed excitedly out of the windows at landmarks they recognized. When, however, after fifteen or twenty minutes in the air, we passed over a large hill, they grew more excited than ever, and I tried to learn the cause. After some linguistic difficulties the reason for their excitement was explained.

It was their custom, occasionally, to visit that hill, in order, I gathered, to collect herbs or something of the kind, and it always took them two days to reach it through the forest. Yet we, in twenty minutes, had flown that distance, and in another half hour had visited still other "distant" places. It is no wonder they were excited. But when we had returned, and landed with a rush and a swoop, I learned something new about natives.

So interested had I been in the reactions of the pygmies in the plane that I had given no thought whatever to the reactions of those we had left behind, but, when, having landed, we opened the doors and turned loose our thirty-six happy and excited guests, I was amazed to see the chief's wife—the mother of the two little girls we had taken—run fearfully forward. She sought out her children and hugged them. She chattered and wept and kissed them repeatedly, fondling them and patting them, eager to reassure herself that they were safe and sound and whole.

Never before had I seen natives kiss each other. Never before, in twenty years spent largely among such people, had I seen such obvious signs of affection. That natives

Above: Two rhinos, undecided on what course to pursue as an airplane flies overhead, are photographed by Mr. Johnson

Right: A fine specimen of a female elephant. Note the slender tusks, differing so greatly from the thicker and heavier tusks of the male

Below: A ground monkey whose curiosity brought him close to the camera

almost always treat their children well, I knew perfectly, but not until that moment had I given a thought to the frightened mother who had seen her children disappear into the interior of the huge and noisy plane——had seen the thing sweep away with a roar and a cloud of dust—had seen it mount into the heavens and disappear so quickly beyond the horizon. What her fears were no one can imagine. She knew nothing of the possibility of engine failure or of conceivable airplane tragedies. Yet certainly she had been afraid—so much afraid, in fact, that in her relief at seeing them safe and sound once more, she showed all too plainly that mother love among the pygmies of the Ituri is no different from the mother love to which we have grown accustomed here at home.

Among our own black "boys," some of whom have come to be fairly competent mechanics, there was no enthusiasm for flying. They would go up when we told them they had to, but on several occasions they chose to walk 150 miles or more to Nairobi rather than fly that distance with us in less than two hours. They knew enough of motors to know that motors sometimes stop, and they had no desire to be in the sky with such a possibility prominent in their minds.

But this should not be an airplane story, for the airplanes, with us, were incidental to animal photography.

Lions

We photographed animals in the Be'gian Congo, in Uganda, in the Sudan, in Kenya and in Tanganyika Territory, but the part of it that Mrs. Johnson and I enjoyed most was our visit to the lion country of Tanganyika Territory where Mr. and Mrs. F. Trubee Davison were our guests. They had come to collect elephants for African Hall at the American Museum, but no visit to the game fields of Africa could possibly be complete without including a call on the "friendly" lions of Tanganyika.

As has often been explained, lions show no fear of, and very little interest in, automobiles, and apparently they do not differentiate between the people in the cars and the cars themselves. Certain it is that in a car one can approach whole groups of lions far more closely than would be possible if one were afoot. A lion will generally sit or stand almost apathetically as a car approaches, and will even yawn, sometimes, in your very face, whereas he would bolt abruptly, or charge, were a person to attempt to walk toward him.

Osa and I, of course, had seen all this time and again. I have taken literally thousands of feet of motion pictures of such lions. As a matter of fact, the cars I use for such work have movable tops, in order to make it possible for me to stand up and "crank." In this position I am plainly visible from my waist up, yet the lions still do not seem to recognize the fact that I am not a part of the car. Were I to step to the ground, however, they would know quickly enough, and I should have to be prepared for either a charge or a bolt.

But while Osa and I had gone through this experience scores of times, the Davisons had not, and I have yet to see the person who, the first time he sees a wild lion in the open, is willing to be too intimate. The first time we took them out, for instance, we paused at a distance of 150 feet or more from some lions we had located, and when I urged Osa, who was driving, to move up closer, Mr. Davison almost angrily objected, obviously under the impression that I was trying to "show off." Yet, after a few days in the field, Mr. and Mrs. Davison drove off alone one morning, and when, after doing some work around camp, Osa and I followed, we found they had driven up so close to a handsome lion that the radiator of the car interfered with the photograph Mrs. Davison was trying to get, with the result that she was standing up and leaning forward precariously, intent only on obtaining a "close-up" of the lion, which surely was within fifteen feet of the car.

Such "hunting" is, after all, quite the most appealing. It is unfair to drive up to

Leopard

These handsome cats are notoriously difficult to photograph, owing to their nocturnal habits and their rapid movements. This fine specimen was photographed on the slopes of Mt. Kenya

almost always treat their children well, I knew perfectly, but not until that moment had I given a thought to the frightened mother who had seen her children disappear into the interior of the huge and noisy plane—
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But while Osa and I had gone through this experience scores of times, the Davisons had not, and I have yet to see the person who, the first time he sees a wild lion in the open, is willing to be too intimate. The first time we took them out, for instance, we paused at a distance of 150 feet or more from some lions we had located, and when I urged Osa, who was driving, to move up closer, Mr. Davison almost angrily objected, obviously under the impression that I was trying to "show off." Yet, after a few days in the field, Mr. and Mrs. Davison drove off alone one morning, and when, after doing some work around camp, Osa and I followed, we found they had driven up so close to a handsome lion that the radiator of the car interfered with the photograph Mrs. Davison was trying to get, with the result that she was standing up and leaning forward precariously, intent only on obtaining a "close-up" of the lion, which surely was within fifteen feet of the car.

Such "hunting" is, after all, quite the most appealing. It is unfair to drive up to

Leopard

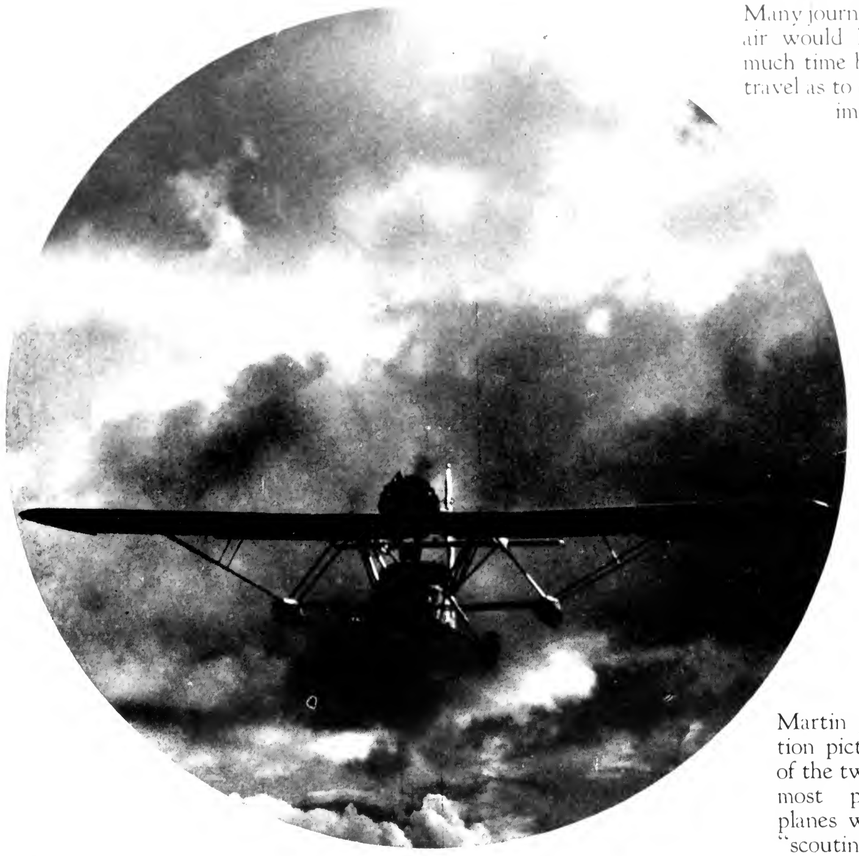
These handsome cats are notoriously difficult to photograph, owing to their nocturnal habits and their rapid movements. This fine specimen was photographed on the slopes of Mt. Kenya

Many journeys easily made by air would have required so much time by other means of travel as to make them highly impractical

Martin Johnson making motion pictures from the larger of the two airplanes. For the most part, however, the planes were used merely for "scouting" and for transportation

Among the Clouds

The Johnsons' planes in the vicinity of Lake Rudolf. In four hours this great body of water could be reached from Nairobi by plane, though on foot the journey would be a matter of weeks and in an automobile it would be foolish to attempt the journey



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In Kenya Colony

The larger picture was taken at the camp established in the Northern Frontier country. The two natives had come to camp with a supply of goat's and camel's milk. The smaller photograph shows Mrs. Johnson fishing for trout near their Mt. Kenya camp, where, at an elevation of about 7000 feet, the fishing was excellent and the game plentiful

the unsuspecting creatures and blast them into "kingdom come" with a rifle. And a lion skin, after all, is no such trophy as a thousand feet of close-up motion picture film. The result of the Davison's lion "hunt," therefore, was that the lions remained unhurt while we finally drove off with our ammunition intact and only our film expended.

There are animals, of course, that are not so easy to approach. And in our efforts to make sound records to accompany our pictures we have met with all sorts of difficulties. Many sounds are rarely to be encountered except at night, and an infinite variety of conditions affect the sound record. The wind, for instance, often sighs and whistles so loudly in the sound record as to ruin otherwise good animal sounds. On one occasion, too, the insects that flew against the sound mechanism ruined the record by the popping sounds they added.

Leopards

On the other hand, we occasionally had a piece of exceptionally good luck, such as favored us in the Northern Frontier country when we unexpectedly obtained an excellent series of pictures and a perfect sound record of a leopard.

We had found a small stream in this mostly dry region not far from which, on either side, stood a low and abrupt cliff. The land beside the stream was level and well dotted with trees and shrubs, among which the animals found a comfortable place in which to live. From cliff to cliff, across this level stretch was, perhaps, half a mile, and from the vantage points that could be chosen on either cliff one could train a camera on the open spots in which the animals occasionally were to be seen.

We set our cameras up, therefore, in the best spot we could find, and took our sound recording apparatus out into the level ground below, connecting it with our equipment by a long wire. Hardly were we ready when a beautiful leopard, all unaware of our presence, appeared in the sunlight well within range of our cameras.

I began cranking immediately, of course, and having obtained an unusually good series of exposures, beckoned to one of our black "boys" who clung to the cliff near by. From long experience, he knew what was expected of him, with the result that he stood up and shouted. Instantly the leopard tensed and snarled. Then, seeing the shouting fellow, the animal charged. Straight toward the cliff he came, while I still cranked. Up the steep rock he leaped, clawing and snarling as he came. For fifteen feet or so he scrambled up, only to slip and slide, still snarling, to the bottom. Again he tried, but by now less determinedly, and, sliding to the bottom once again, he gave it up. Turning back his lips and snarling once more, he stared upward for a moment, and then turned away and disappeared among the bushes.

It may seem in the telling that that is not very much, but leopards are hard to photograph. They are mostly nocturnal animals—small, very rapid, and unexpected in their movements. Thus it was distinctly an accomplishment to obtain so clear a motion picture with the sound record to go with it.

Our work in Africa has come, after fourteen years, to be a round of experiences forever similar to and different from earlier experiences that we have had. When we were new to the work, the unexpected was forever happening, but that is less true now. We have had experiences with most of the different animals and understand them better than we did, and the same is true of the natives. Consequently, though unexpected things are bound to occur in such a task as ours, they are rarer, now, and even the unexpected has about it less of the surprising. We do not feel that Africa is a land of danger. It is, instead, a delightful land, filled with the most appealing of natives and animals, among whom, now, we feel most pleasantly at home.

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Lion and Lioness

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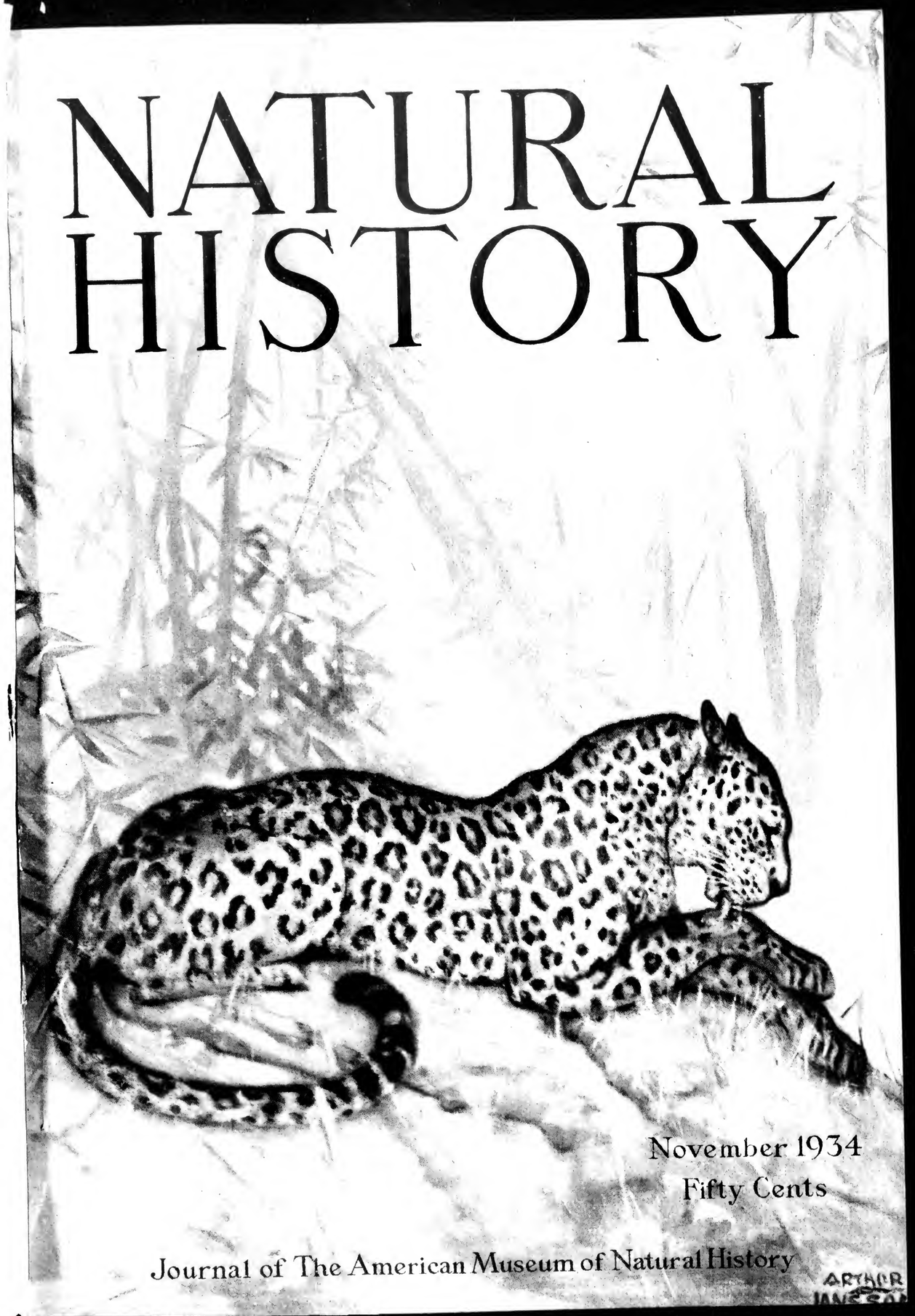
NATURAL HISTORY



November 1934
Fifty Cents

Journal of The American Museum of Natural History

ARTHUR

Photograph by Mary L. Jobe Akeley

Mount Karisimbi in fresh snow

AFRICA'S GREAT NATIONAL PARK

Carl Akeley's Gorilla Sanctuary and Biological Survey Station Becomes a Reality—The Formal Inauguration of the Parc National Albert at Brussels

By MARY L. JOBE AKELEY

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He also said that the largest male, a magnificent creature weighing 380 pounds, like all the others secured by the expedition, showed only a disposition to get out of danger. He stated that he was communicating with the authorities at Brussels in regard to establishing a sanctuary for the gorillas of the Kivu country where they may have protection for all time. He then added: "If this is not done very soon, they are in positive danger of being exterminated. I do not think it is fair to future generations to exterminate an animal of such intense human interest as the gorilla. He is harmless; the natives of the region have no fear of him and he in no way interferes with them. He occupies a region that will never be available for agriculture or other human uses more than to supply forest products such as bamboo and fire wood, and the native privileges need not be curtailed by con-

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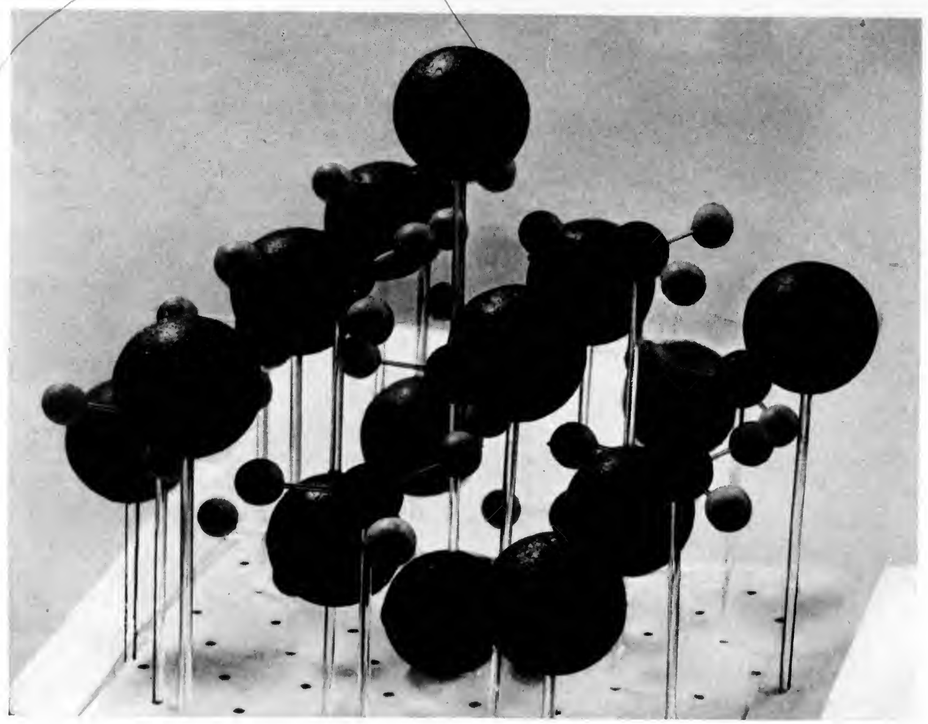
The new demonstration of crystal structure has been responsible for the elimination of some of the time-honored concepts of mathematical crystallography. We have found, for instance, that rhombohedral crystals, like calcite and quartz, that have heretofore been classed with the hexagonal system, are structurally more nearly allied to isometric atomic groupings, and should therefore belong to a distinctly separate system. Also the old concept of hemihedrism in crystals becomes structurally unfounded, however much it may add to convenience in treating them mathematically, and when we consider the atomic structure of sphalerite.

In general, the work that is now being energetically pursued in countless laboratories throughout the world by investigators who are using the X ray to determine crystal structure, has shown that simplicity and not complexity lies at the base of this great problem.

The examples we have taken to show how directly in very many instances crystal structure has at its foundation the close-piling principle, are not exceptions but standard types. It would then seem that here we have another comprehensive law reaching down to the very roots of material things.



ATOMS COMPOSING CALCITE

Fig. 12.—The atoms composing calcite, represented in relative position by the cork balls of this model, are of three kinds. The large balls represent the atoms of calcium, the black balls those of carbon, and the white balls, grouped in threes about the black ones, atoms of oxygen

verting a great tract of primitive country into a gorilla reserve. I not only want to establish a sanctuary, but also a biological survey station, where students of animal psychology and kindred subjects may carry on their research work under most advantageous conditions."

On January 18, 1923, Mr. Akeley compiled various suggestions regarding the establishing of a sanctuary for the gorillas, and submitted these to his esteemed friend, Dr. John C. Merriam, of the Carnegie Institution, Washington, dean of ardent conservationists and promoter of scientific research. He called attention to the fact that the number of gorillas in the Kivu region is small, which seems strange since, so far as we know, they have no enemy but man and the natives do not molest them; that they are healthy; that they are not wild, as was shown when three of them ran onto a leaning tree 150 feet away to get a better look at him and were apparently unconcerned, though he was in full view operating a motion-picture camera. He recalled the fact that even with one of their number shot, they moved away only a short distance where they were easily approached again, and he stated that obviously it would be a very easy matter to exterminate this colony.

He suggested setting aside as an absolute sanctuary an area approximately ten miles square, where, when undisturbed, the gorillas would soon have complete confidence in man and would doubtless afford opportunity for observation and study at close range; and also that the area should be bounded by a native-police-patrolled roadway, a "dead line," within which the "gorillas would soon learn that they were safe, and beyond it in danger" and that there would be "no difficulty in keeping them within the sanctuary unless it became over-populated."

Photograph by Mary L. Jobe Akeley

THE PRIMITIVE FORESTS OF THE PARC NATIONAL ALBERT

This shows a section of the Rugeshi or Cold Forest on the slope of Mount Karisimbi

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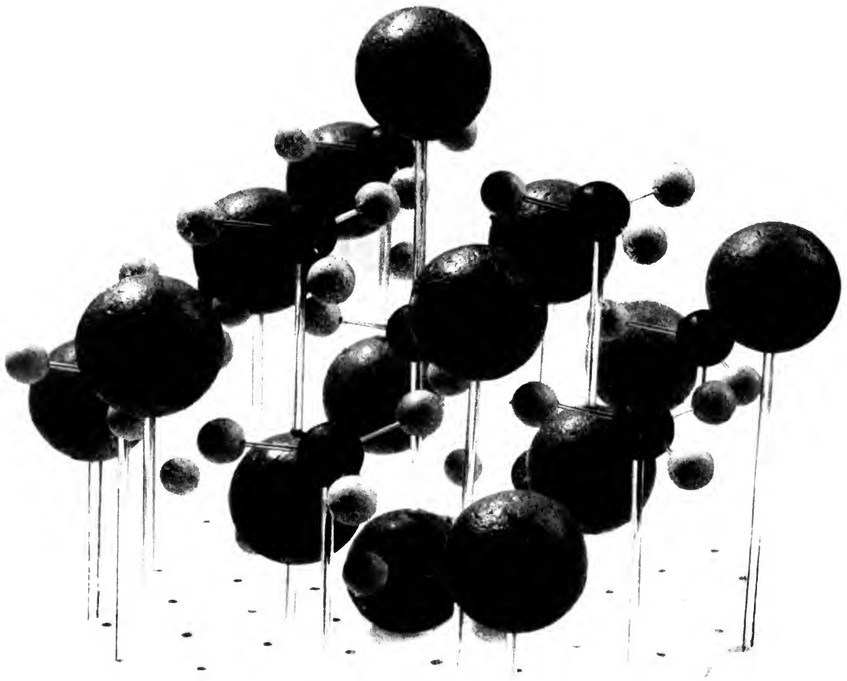

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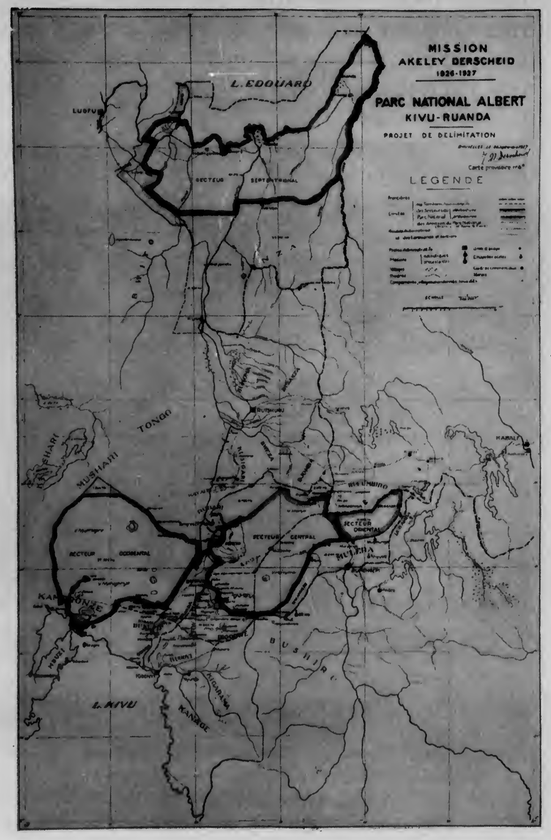
This shows a section of the Rugeshi or Cold Forest on the slope of Mount Karisimbi

Map showing location of the Gorilla Sanctuary

"In coöperation with the Belgian Government," he wrote, "it is my desire to see an organization estblished which shall undertake to make provision for its care and maintenance; to establish and maintain a scientific research station with residence and laboratory facilities located at an altitude of approximately six thousand feet where the climate is suitable for the continued residence of Europeans. One resident white superintendent would be required to be in charge of the station and to oversee the patrol and maintenance. I wish to emphasize the importance of making this region an *absolute sanctuary!* Sanctuary is not sanctuary unless *absolute.*"

Doctor Merriam immediately turned over this statement with his strong recommendation of the gorilla sanctuary plan to Baron Emile de Cartier de Marchienne, then Belgian Ambassador to the United States. Doctor Merriam also submitted a statement covering the organization, history, and method of establishing the national parks, monuments, and bird refuges in America. Several months before, Mr. Akeley had interested the Belgian Ambassador in the results of the gorilla expedition and the plan of conservation. Accordingly, early in 1924, the Ambassador began active efforts with his home government to the end that not only the small area of the reservation be secured, but that a larger outlying tract of land be set aside as additional protection to the gorilla.

Seconding the efforts of Baron de Cartier with unremitting devotion, was



Map showing the enlarged area of the Parc National Albert as established by Royal Decree of Albert, King of the Belgians, May 6, 1929, and suggested by the Akeley-Derscheid Mission of 1926

Photograph by Carl Akeley

A GROUP OF KIVU PYGMIES

The pygmy, doubtless the earliest of primitive peoples in the Kivu forest, dwells in the lower reaches of the volcanoes. The mature pygmy is approximately four and a half feet in height, and looks like a ten-year old child in contrast with the native Wahutu, who is only average height

the Belgian Consul-General at Baltimore, Mr. James Gustavus Whiteley, whose helpful interest for more than twenty years had furthered the scientific expeditions sent to the Congo by the American Museum of Natural History.

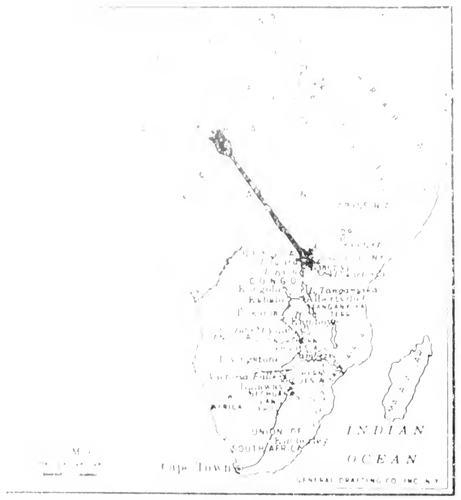
Among American organizations interested in the project were the Camp Fire Club of Michigan and the New York Zoological Society, both of whom in resolutions to Baron de Cartier expressed keen interest in the undertaking. The Department of the Interior of the United States also voiced its interest in a memorandum to the press.

On March 2, 1925, His Majesty, Albert, King of the Belgians, created by Royal Decree the Parc National Albert, Kivu District, Belgian Congo. A letter from His Excellency, Baron de Cartier, to Doctor Merriam, president of Carnegie Institution and vice-president of the National Academy of Sciences, supplies the historical development of the Park at this point:

The advance of civilization into Central Africa has brought with it its inevitably attendant menace to primitive forms of wild life. This National Park has therefore been laid off, under the auspices of His Majesty King Albert, as a sanctuary where both animals and plants and natural scenery may be preserved and where scientists from all over the world may eventually come to study the flora and fauna of Africa in their original and natural surroundings.

During the past few years there has been an ever-increasing influx of big game hunters and natural scientists into the Belgian Colony which is the last refuge of many rare species of African fauna. The Belgian Government has recognized the necessity of permitting a certain number of such rare animals to be taken for scientific purposes, but has consistently endeavored to preserve these rare species and also to prevent the wanton destruction of other less rare, but harmless, animals, whose slaughter serves no useful purpose.

In these circumstances the Belgian Colonial Authorities have found it necessary to restrict not only private hunting expeditions but also similar expeditions contemplated by many of the



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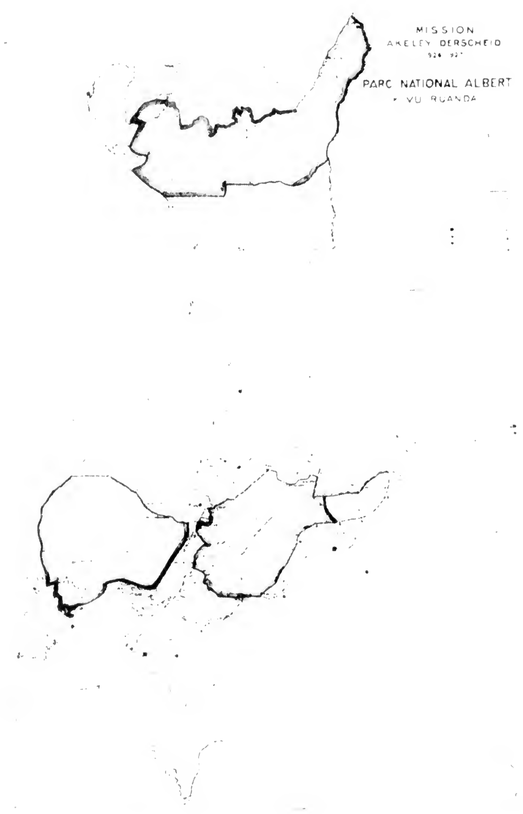

Map showing the enlarged area of the Parc National Albert as established by Royal Decree of Albert, King of the Belgians, May 10, 1929 and signed by the Ministers Deputies of State, May 22, 1929

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In these endeavors the Belgian Colonial Authorities have [illegible] not only [illegible] but also [illegible] scientific [illegible]

THE HEART OF THE PARC NATIONAL ALBERT—
This painting, by W. R. Leigh, was made under the direction of Carl Akeley, and is, in Mr. Akeley's own words, of "the most beautiful spot in the world"

most distinguished museums of natural history and other scientific bodies.

Among the rare animals which are in danger of extinction is the Gorilla—an animal of extreme interest to scientists. The Belgian Government has, in the past, felt it its duty to permit a few specimens to be killed or captured for strictly scientific purposes, but the time has come when, in the interests of humanity, as well as in the interests of Science itself, steps must be taken to preserve the remaining gorillas from extermination.

The reservation embraces the three volcanoes, Mt. Mikeno, Mt. Karisimbi and Mt. Bishoke.

In this Parc National Albert it is planned to erect a laboratory for biological studies where scientists from all parts of the world may eventually come and study the flora and fauna of the Belgian Congo as well as the geological and meteorological conditions.

In inaugurating this new experiment—the first of its kind in Central Africa—the King and his officials have studied the great American reservations and national parks and have sought the advice of eminent American scientists.

In order that the best results may be achieved it is hoped that this humanitarian and scientific project may receive the sympathetic coöperation of the members of the National Academy of Sciences, and the benefit of their experience and wise counsel.

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Mr. Akeley's enthusiasm for the consummation of his dream and his appreciation of the action of His Majesty, the King, and the efforts of Baron de Cartier, are voiced in the following letter to the Belgian Ambassador:

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Of course the killing of a reasonable number of specimens for scientific institutions is legitimate and necessary, but the indiscriminate killing by sportsmen and others is unpardonable. Killing gorillas cannot possibly be considered sport; the animals are easily located with the help of native guides in the regions they inhabit, easily approached, and easily killed. They are not wild in the sense that most hunted animals are wild.

They are not great wanderers. They are reluctant to leave the region in which they live, so it is possible, by following a band or a single animal, to come within shooting distance a number of times in one day.

Unfortunately there is a large class of men who for one reason or another, are constantly seeking excuses for killing. The gorilla, because of his unjust reputation for vicious ferocity, makes a strong appeal to the would-be hero type of sportsman, and the gorilla is menaced by the "white hunter" who would exploit him in catering to these "sportsmen" and for his own financial benefit.

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It may be stated here that back in 1921 the officials of the Belgian Government kindly gave Mr. Akeley permission to obtain ten gorillas. He took only five, feeling that this number of specimens was ample for a group that would tell a true story of the gorilla.

In February, 1926, in Brussels, while en route to Africa, we were entrusted with the Mission to the Kivu, which empowered us to execute a general survey of the National Park; to fix on the map native villages, position of forests, bare rocky country, grass lands, cultivated land and pasture, and areas inhabited by gorillas and chimpanzees; to estimate the number of these animals; to study methods of preservation of the fauna, especially the gorillas; and to select suitable sites favorably located and naturally endowed for laboratories and residences for park conservators and visiting scientists.

Later Dr. J. M. Derscheid, of Brussels, research zoölogist, conservationist, and cartographer, joined our 1926 expedition to the Kivu to assist in this survey. After Mr. Akeley's death, Doctor Derscheid's presence made it possible for the expedition to fullfil the mission of the Belgian Government.

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An important section from our plan follows:

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Furthermore, on account of the different altitudes—ranging from 2,500 feet to more than 14,000 feet—nearly all kinds of vegetation, from the palm-fringed equatorial rivers to the flower-filled alpine meadows under the snow-

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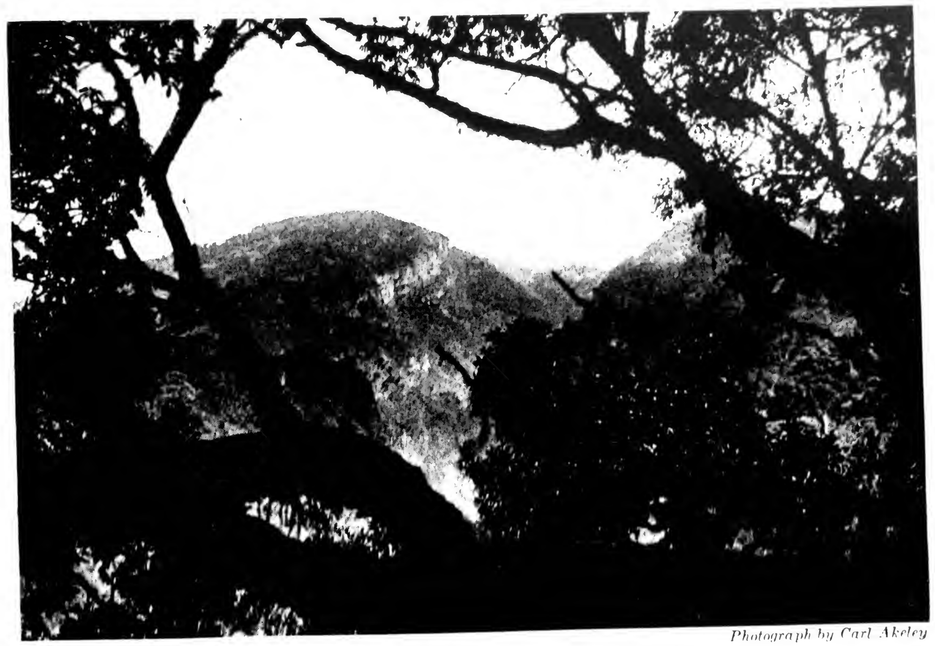

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The memorandum further includes questions of ownership, native rights, jurisdiction, etc.

As a final matter, the question of scientific research is dealt with. It provides for a central station at Rutshuru for the administration of the park and to serve as a permanent base for scientific research; for the use of certain vacant colonial buildings as a warden's office and domicile, and for the construction of others for the essential use of scientists and desirable visitors. Well equipped laboratories, an adequate scientific library, a small local study museum of geological, botanical, and zoölogical collections should be established in order to facilitate research.

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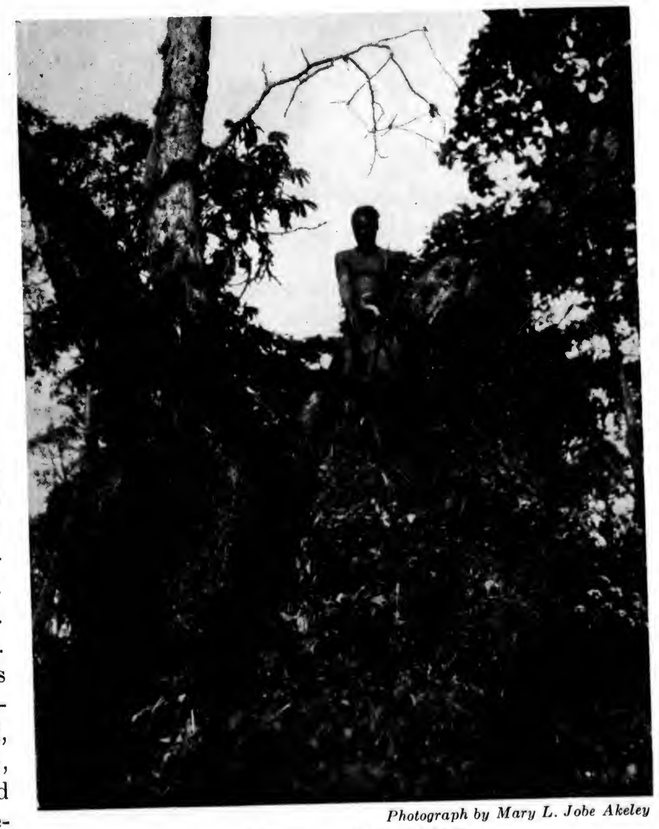
A few days after our evening at the Palace in Brussels, Derscheid and I described the gorilla country, the plans for conservation, and also our scheme for scientific research therein before the Society for the Preservation of the Fauna of the Empire at the Zoölogical Society in London. At the December meeting of this society Baron de Cartier introduced



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M'GURU, GORILLA GUIDE

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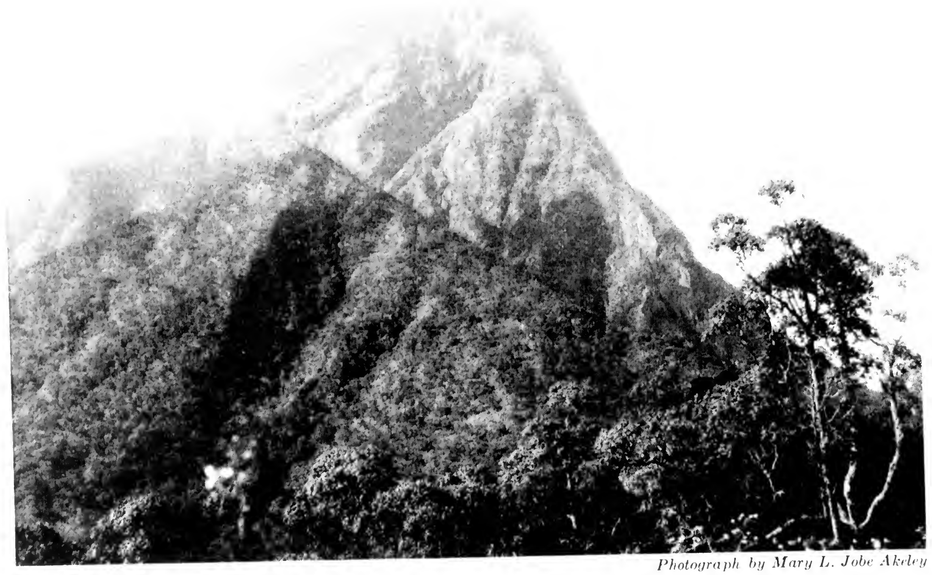

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It suggests also that "small ranger stations be located in places of strategic importance and rich in opportunity for accomplishing a serious survey of the Park, the first being located on the middle slopes of the north side of Mount Karisimbi on the shore of the small Lake Rukumi, discovered by Derscheid in 1926 near tree line. This pond is above the region of heavy cloud and abounds in the most interesting animal species—gorilla, buffalo, elephant, leopard, hyrax, antelope, squirrel, sunbirds, plaintain eaters, et cetera."

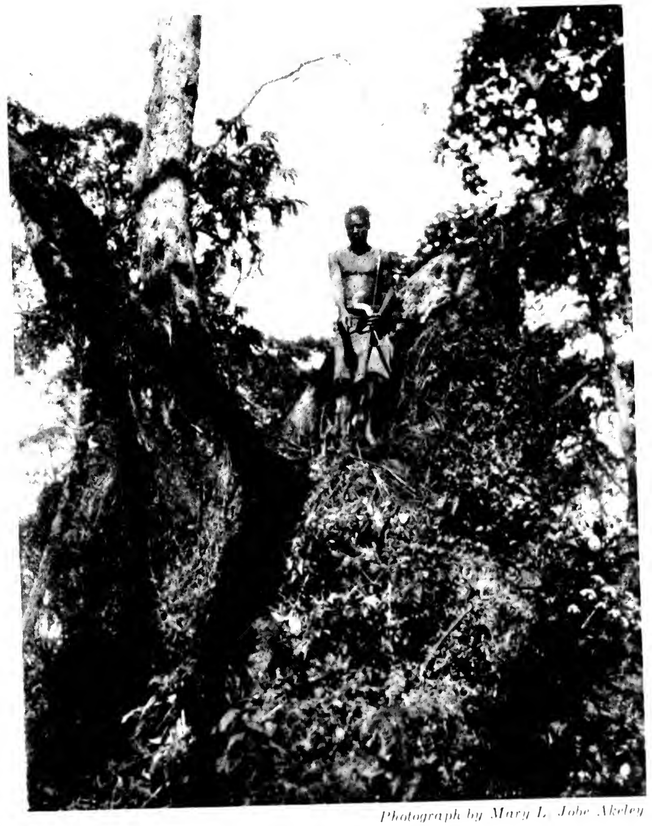
[1] The main motor highway from Redjaf to Kisenyi, which is now nearing completion, will run through the Parc National Albert.

In conclusion, the memorandum states that "in view of the determination of the Belgian Government to support the park, which is a region of international scientific importance, and because it seems wise to secure competent direction by men perfectly aware of the needs of scientific research and nature conservation and who have had experience in such matters, it appears wholly desirable to place the management of the park in the hands of a Belgian scientific institution which is so favorably situated as to obtain financial and scientific help both in Belgium and in foreign countries."

This memorandum approved by His Highness, Prince Albert de Ligne, and His Excellency, Baron de Cartier, was submitted to His Majesty, Albert, King of the Belgians, on October 8, 1928, by Prince Albert de Ligne. The following evening His Majesty and Their Royal Highnesses, the Duke and Duchess of Brabant, received in the Palace at Brussels the Belgian Ambassador to the United States and Princess de Ligne, the American Ambassador to Belgium, and Mrs. Hugh Gibson, the Prime Minister and Minister of the Colonies, M. Henri Jaspar and Mme. Jaspar, M. and Mme. Franqui, and other friends of science, as well as Doctor and Mme. Derscheid, and myself. There, throughout a long and intensely interesting evening, the project of the park was discussed.

Derscheid gave an account of the findings of the Akeley-Derscheid Expedition and projected photographs of the Kivu. I had taken with me to Brussels the gorilla film which Mr. Akeley had made in the Kivu, and this we showed to His Majesty and Their Highnesses.

A few days after our evening at the Palace in Brussels, Derscheid and I described the gorilla country, the plans for conservation, and also our scheme for scientific research therein before the Society for the Preservation of the Fauna of the Empire at the Zoölogical Society in London. At the December meeting of this society Baron de Cartier introduced



Photograph by Mary L. Jobe Akeley

M'GURU, GORILLA GUIDE

He is perched in a moss-covered tree, which was brought to America by Mrs. Akeley as an accessory for the Gorilla Group for the Akeley African Hall

Mr. Akeley's gorilla film and Derscheid again spoke, both expressing the earnest hope that the British Government may make absolute sanctuary of the Uganda side of the gorilla volcanoes.

Inasmuch as the boundary between the Belgian and British volcanoes is not an impassable natural barrier, it is easy for gorillas to range from one side to the other as they undoubtedly do. To have complete protection on the British side would be an unquestionable guarantee that the Belgian gorillas would have absolute sanctuary. Mr. C. W. Hobley, acting as Secretary of the Society for the Preservation of the Fauna of the Empire, wrote me on June 20, 1929, that the society had this matter in hand, and that the Zoölogical Society of London was supporting the proposal and had taken the matter up independently with the Government.

Throughout the fall and winter months of 1928–29 Prince Albert de Ligne has been untiring in his efforts to push to completion the satisfactory organization of the Park to the end that scientific work be begun and also that the always necessary financial support be secured. Likewise Dr. John C. Merriam, in a letter to me on March 30, 1929, expressed his continued interest:

> The Parc National Albert project is to me one of the most interesting and important plans of this nature being studied in the world at the present time and I am extremely desirous of seeing it reach the very high level of effectiveness which I know is desired by all concerned.

As an outgrowth of this keen interest, in the late spring of 1929 a joint expedition to the Parc National Albert was proposed by the Carnegie Institution and Yale University. Permission for the undertaking was received from the Belgian Government through Prince de Ligne. The expedition started for Africa in June, under the direction of Dr. Harold C. Bingham, associate of Dr. Robert M. Yerkes in the Institute of Psychology at Yale, to conduct a psychological investigation of the habits and behavior of the mountain gorilla in the Kivu sanctuary.

Another expedition, sent out jointly by Columbia University and the American Museum of Natural History for scientific investigation in both the Belgian and French Congo, entered Africa in July, 1929. It is in charge of Henry C. Raven, associate curator of the department of comparative anatomy in the American Museum. The other members are Dr. William K. Gregory, curator of the department of anatomy in the American Museum, professor of vertebrate paleontology at Columbia University, and author of works bearing on the evolution of man; Dr. J. H. McGregor, professor of zoölogy at Columbia University, and an authority on the anatomy of the anthropoid apes and man; and Dr. E. T. Engle of the department of anatomy at the College of Physicians and Surgeons, Columbia University, and a specialist in endocrinology and physiology. Their object is to trace the source of functional disorders common to both gorilla and man, with a view to alleviating the sufferings of man. These scientists also expect to visit the Parc National Albert to observe the gorilla in his wild state and to study the gorilla's relationship to man. That the findings of both expeditions will be of rare significance is without question.

The crowning achievement in the history of the organization of the Parc National Albert is The Royal Decree signed May 6, 1929, which was confirmed by the Colonial Council and re-confirmed by King Albert in June, 1929. *King Albert has by this act created a corporate body in the Belgian Congo and in the mandated territory of Ruanda-Urundi for preservation of fauna and for strictly scientific purposes.*

The park has been greatly enlarged by this act and now consists of 500,000 acres

Photograph by Mary L. Jobe Akeley

THE HOME OF THE GORILLA
Looking across the jungle-clad lower slopes of Mt. Mikeno to the lava plains below

and comprises four Reserves, or Sectors, lying in the Kivu District, in proximity to one another. Within these Reserves it is forbidden, under penalty of penal servitude or fine, or both, (1) *to pursue, capture, kill, or molest in any way, any kind of wild animal, including animals which are reputed dangerous or harmful,* (2) to take or destroy the eggs or nests of wild birds, (3) to cut down, destroy, or remove any uncultivated plant, or (4) to make any excavation, embankment, boring, or any operation of a nature to change the aspect of the ground or of the vegetation.

Unless provided with a special permit, no one (except officials and others properly qualified) may enter the Parc National Albert, or circulate, camp or sojourn therein, or introduce dogs, traps, or firearms, or possess or transport or export skins or other parts of wild animals or uncultivated vegetable products.

As the four Reserves, or Sectors, of the Parc National Albert include certain tracts of land now occupied by natives or previously granted to private persons or companies, provision is made for the expropriation of these tracts, if found proper and desirable. and it is further provided that even on these tracts under private or native occupation, *the destruction, capture or pursuit of the gorilla, as well as all forms of hunting this animal, are absolutely forbidden.*

To the four Reserves, or Sectors, of the park proper, there are added certain adjacent territories, under less severe restrictions, to serve as protecting zones to the Reserves. These protecting zones are sparsely inhabited by natives. In these zones, hunting, fishing, and, cutting down trees are prohibited, except that the few natives now living there will be permitted to exercise their customary rights which

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they now enjoy but only with the primitive weapons which they still use.

The Belgian Colonial Government undertakes to create and maintain, at its own expense, a corps of conservators and a corps of native police, and to pay the strictly administrative expenses of the park. The Parc National Albert is to be administered by a Commission ("*Commission du Parc National Albert*") and by a Committee of Direction.

The *Commission du Parc National Albert* will consist of not less than eighteen members; one-third, including the President, to be appointed by the King; another third to be selected by the King from nominations made by Belgian scientific institutions; and another third to be chosen from among members of foreign scientific institutions.

In addition to its administrative functions, the Commission is authorized, subject to the approval of the King, to accept gifts, legacies, and other donations which may be contributed to further the scientific purposes of the Parc National Albert.

King Albert has already appointed Dr. John C. Merriam and Dr. Henry Fairfield Osborn as members of this commission. This act of the Belgian Government stands as an epochal opportunity for science. Both broad-mindedness and liberality are shown in their willingness to have foreign scientists share in the administering board. It points to that long-hoped-for internationalism in conservation and in science and to a widening interest in protection throughout all Africa.

A NATIVE IN A GORILLA NEST

Photograph by Mary L. Jobe Akeley

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Asia

C. Hart Merriam
Papers
BANC MSS
80/18 c

E.B.Tyler in his account of ancient Mexico writes:

"The Mongols, Tibetans, Chinese and other neighboring nations have a cycle or series of twelve animals, viz. rat, bull, tiger, hare, dragon, serpent, horse, goat, ape, cock, dog, pig, which may possibly be an imitation of the ordinary Babylonian-Greek zodiac familiar to ourselves. The Mongolian peoples not only count their lunar months by these signs, but they reckon the successive days by them, rat-day, bull-day, tiger-day, &c., and also by combining the twelve signs in rotation with the elements, they obtain a means of marking each year in the sixty-year cycle, as the wood-rat year, the fire-tiger year, &c."

Enc.Brit. 11th Ed. Vol.18, p.330, 1911.

And similarly Agnes Mary Clerke states: "The Chinese circle of the 'animals" obtained early a wide diffusion. It was adopted by Tatars, Turks and Mongols, in Tibet and Tong-king, Japan and Korea. It is denominated by Humboldt the 'zodiac of hunters and shepherds,' and he adds that the presence in it of a tiger gives it an exclusively Asiatic character. . . Years "of the Rat," "of the Tiger," "of the Pig," still figure in the almanacs of Central Asia, Cochin China and Japan."--Enc.Brit.11th Ed. Vol.28,p.995, 1911.

Humboldt, in describing the oscillations of the Orinoco in South America in comparison with those of the Nile in Egypt and Abyssinia, comments on the annual rise and fall of the great rivers of the torrid zone resulting from the equatorial rains, and diverges to consider the bearing these have upon the Zodiac. He writes:

"In the two zodiacs vulgarly called the Tartar and Chaldean, or Egyptian (in the zodiac which contains the sign of the Rat, and in that which contains those of the Fishes and Aquarius), particular constellations are consecrated to the periodical overflowings of the rivers. Real cycles, divisions of time, have been gradually transformed into divisions of space; but the generality of the physical phenomena of the risings seems to prove that the zodiac which has been tramsmitted to us by the Greeks, and which, by the precession of the equinoxes, becomes an historical monument of high antiquity, may have taken birth far from Thebes, and from the sacred valley of the Nile. In the zodiacs of the New World--in the Mexican, for instance, of which we discover the vestiges in the signs of the days, and the periodical

series which they compose--there are also signs of rain and of inundation corresponding to the Chou (Rat)[1] of the Chinese and Thibetan cycle of Tse, and to the Fishes and Aquarius of the dodecatemorion. These two Mexican signs are Water (Atl) and Cipactli, the sea-monster furnished with a horn. This animal is at once the Antelope-fish of the Hindoos, the Capricorn of our zodiac, the Deucalion of the Greeks, and the Noah (Coxcox) of the Azteks."--Humboldt's Personal Narrative, Vol.3, pp.12-13, 1885.

BOND

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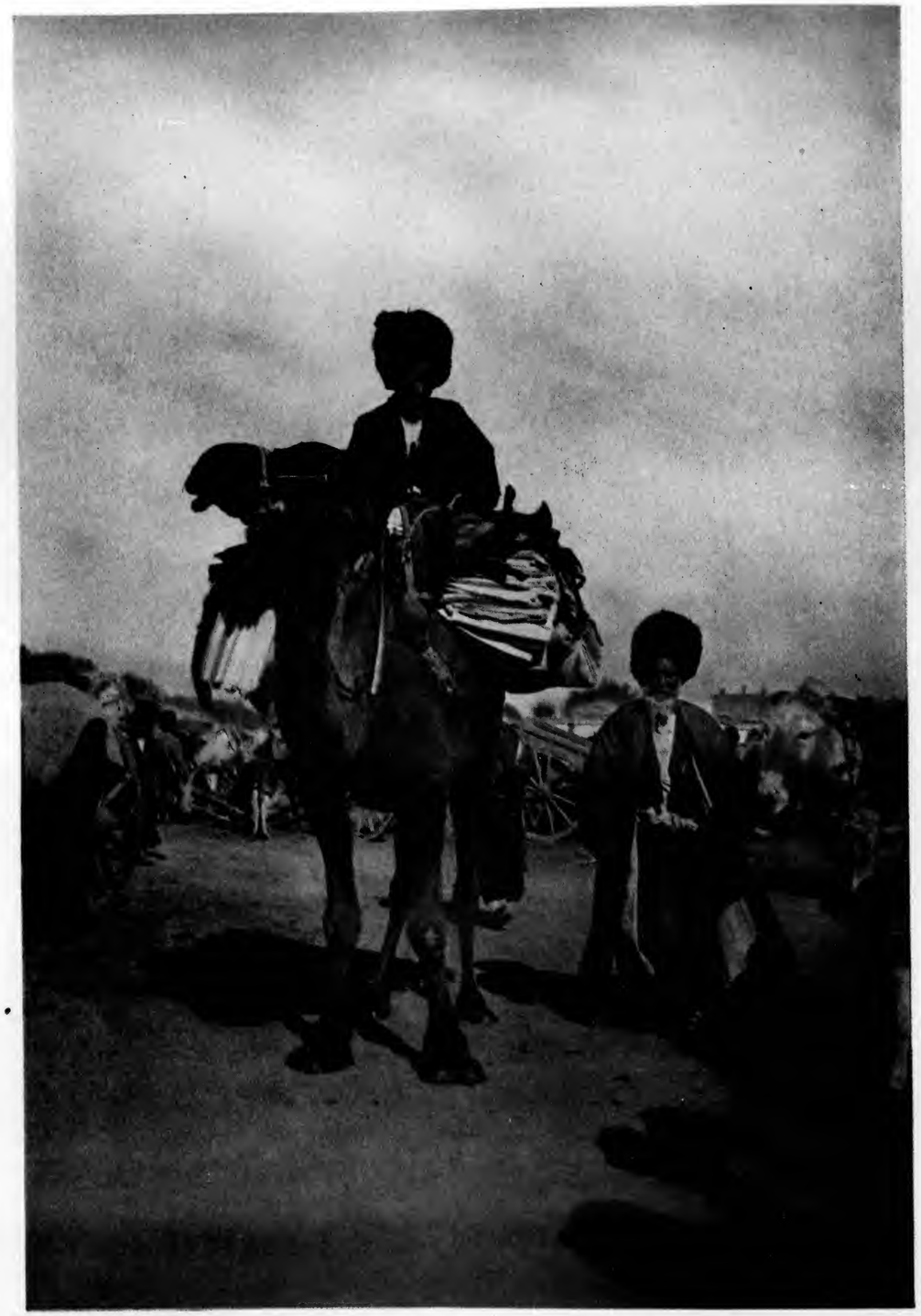
[1] "The figure of water itself is often substituted for that of the Rat (Arvicola) in the Tartar zodiac. The Rat takes the place of Aquarius. (Gaubil, Obs. Mathem., vol.iii, p.33.)"

WHERE SLAV AND MONGOL MEET

RUBY AND AMETHYST IN FERTILE FERGHANA

Their homeland lies to the north of the Pamir, that elevated region which forms the southeastern border of Bokhara and which native tribes call the "roof of the world." These little ladies in their parti-colored robes are Sarts, a term said to have originated with the nomads as an opprobrious nickname for sedentary peoples. Nowadays it is commonly applied to the city-folk of Central Asia as opposed to the agricultural, or rural, population.

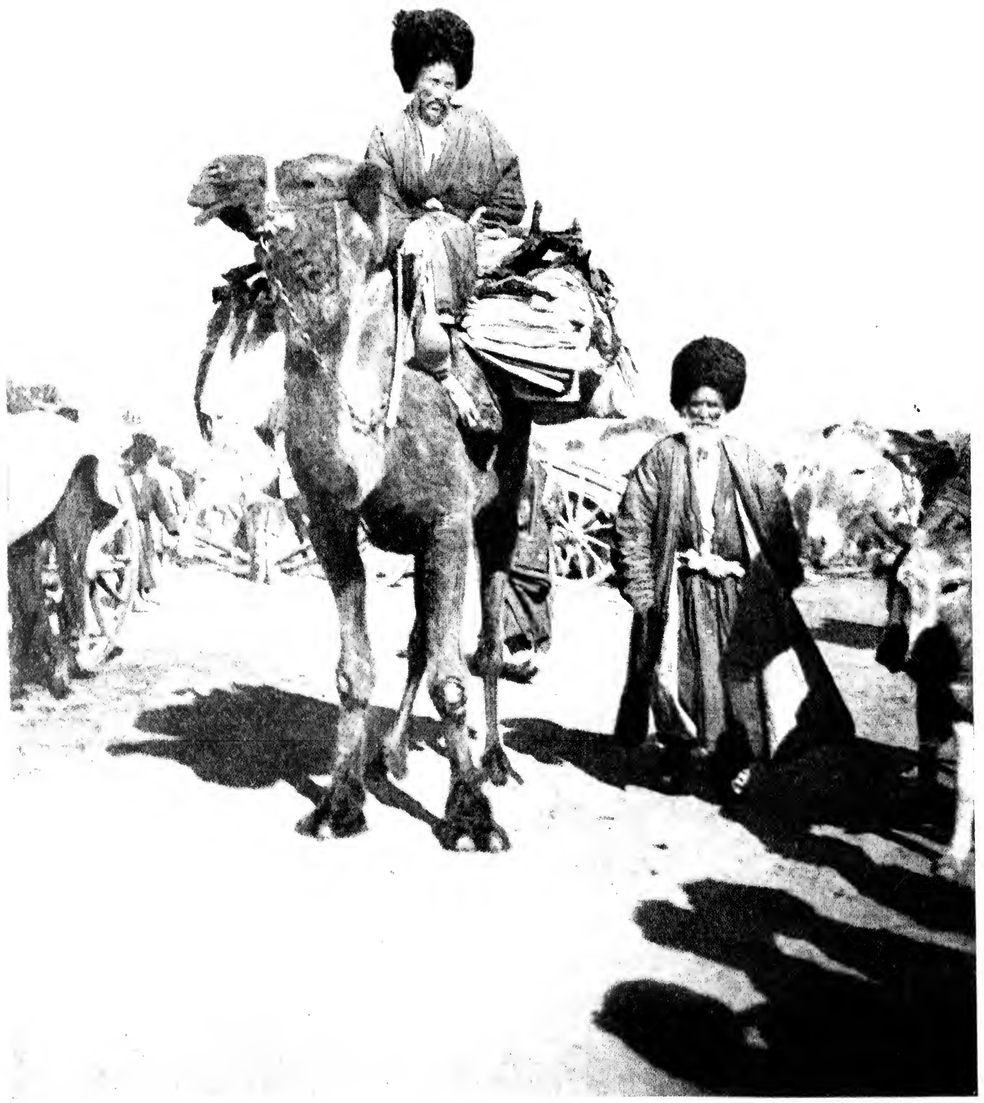


A TURKOMAN SKIPPER WITH HIS DESERT SHIP MAKES THE PORT OF MERV

His camel cargo consists of two bales of felt. The pedestrian at the right, who resembles a bit of autumn foliage in his flowing robe of green, brown, and gold, is also a prosperous merchant attending the semi-weekly fair in this famous oasis city of Russian Turkestan.

DEVIL DEVOTEES OF THE CAUCASUS

These women belong to a sect of Devil-worshipers. They represent the Author of evil as a peacock and avoid mentioning his name. Calling themselves Dasni, they are found in Armenia, Kurdistan and the Caucasus.



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THERE IS NO AGE OF PLAY FOR THE BOY SCOUTS OF ARMENIA

Sired by suffering, these lads are the stalwart hope of a people who are experiencing a rebirth of national life. They endured indescribable privations when their land was the battle-ground of the contending Turkish and Russian armies, but with the advent of peace they can lay aside their pathetic symbols of warfare and join the universal brotherhood of boyhood in alternate study and recreation.

RAGS MAY BE ROYAL RAIMENT WHEN WORN IN ARMENIA

Peasant and noble-born have suffered alike at the hands of the Turks for hundreds of years. Armenia was the first nation on earth to espouse the cause of Christianity, and today, after centuries of persecution, civilization promises her people surcease of sorrow.

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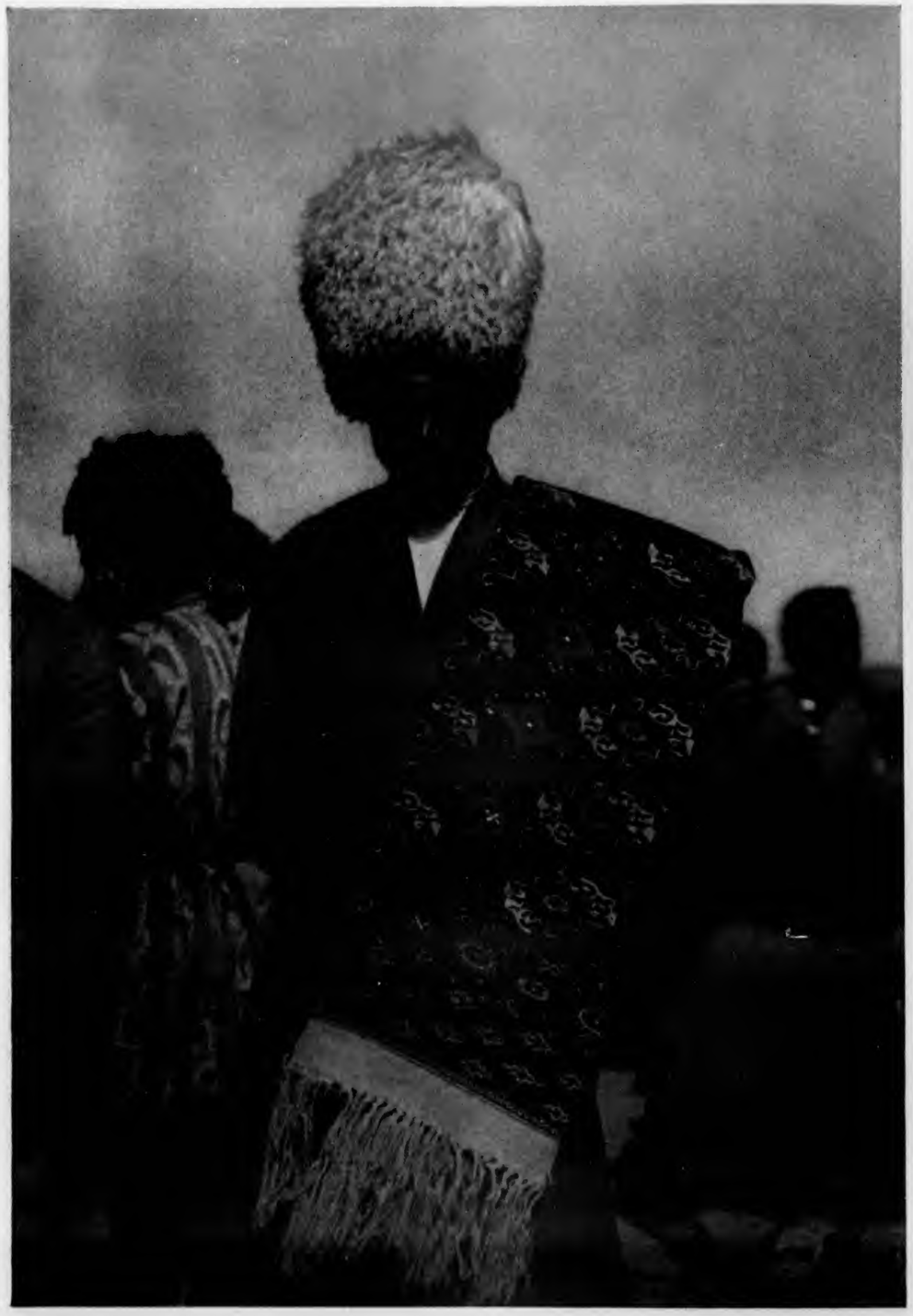

THE LOVELIEST PRODUCT OF THE DESERT LOOM

The Bokhara rug merchant is fully conscious of the superior quality of his offering with its sheen of soft and sober colors. The long-fibered, spotless wool from which it was woven represents years of careful selection; its soothing reds are from Bokhara itself, its velvety blues from Afghanistan. Its warp and woof chronicle in the language of lasting beauty the desert maiden's labor, whose product is her marriage dower.

A TURKOMAN OF RUSSIAN TURKESTAN

With his shaggy sheepskin shako and his flowing caftan, he is an ideal artist's model, whether striding about the marketplace of Merv with unconscious grace, mounted on stalking camel and leading his caravan across the desert vastness, or swaying in perfect unison with his galloping steed of the steppes.

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THE DAWN OF A BRIGHTER DAY IN ARMENIA

The stricken city of Van huddles at the base of historic Castle Rock on whose faces are chiseled the records of the kings of long ago. The Turks confiscated all the cattle of the inhabitants, but this Armenian is starting life anew with a herd which he has driven from Persia. The snow which softens the scarred and jagged outline of shattered homes only adds to the accumulated sufferings of the populace.

EVEN POVERTY MAKES A PICTURE IN THE NEAR EAST

This is the bread line at Van, the Armenian city which tradition says was founded by Semiramis, the famous Assyrian princess about whose name legend has woven a wealth of romance and spectacular achievement. During the bitter days of the World War, nine-tenths of a pound of bread a day was allotted to every Armenian who had the money with which to purchase it.

AMONG THE MENDERS IN SAMARKAND

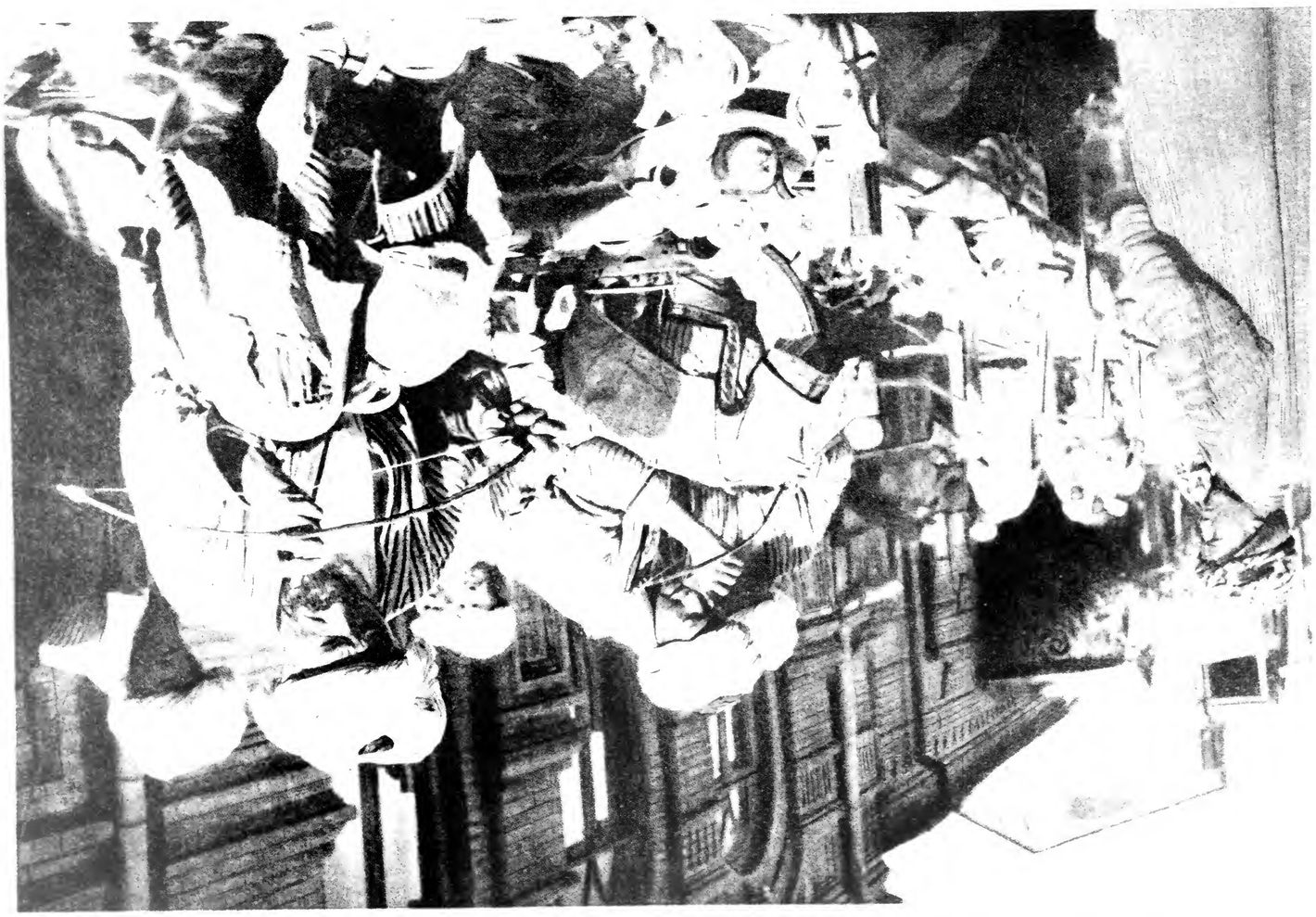
Patience and skill are required in repairing broken crockery with the implement here employed—a bow drill, which bores tiny holes in the broken parts, after which the delicate pieces of china are adroitly bound together by means of copper rivets.

A RAINBOW WAS SHATTERED AND THE FRAGMENTS FELL IN THE GRAIN MARKET OF SAMARKAND

From the city which now boasts this peaceful, picturesque scene Timur the Lame once governed an empire that stretched from Siberia to the Dardanelles and from the Ganges to the Persian Gulf. The tomb of the Tatar conqueror, whose name is still used to strike terror to the hearts of children, lifts its dome of turquoise blue in a quiet section of the city, and nearby cluster the beautiful mausolea of his loved ones.

A SUNDOM MAN SHAVING AND THE BRAHMANS SEEN IN THE GRAIN MARKET OF SAMARKAND

AMONG THE MUSICIANS IN SAMARKAND



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MELON MEN OF SAMARKAND, ONCE THE SHOW CITY OF CENTRAL ASIA

In such luscious fruit it would seem that Nature furnished the architects of the Near East the patterns after which they fashioned the domes of those ubiquitous mosques and mausolea whose undulant curves distinguish the sky-line of every Mohammedan city.

A PROFESSION OF ENTENTE CORDIALE BETWEEN SELLER AND BUYER IN BOKHARA

Perhaps it is the gorgeous rug in the foreground which has changed hands; if so, there is occasion for congratulating the purchaser upon his matchless new possession and the former owner upon the handsome sum which is exchanged when the two palms meet.

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MORNING-GLORIES ADORNING AN OLD WALL IN BOKHARA

Wherever the male population of Bokhara foregathers there is a commingling of hues and tints rivaling a bed of pansies in full bloom. The sartorial plumage of the Bokhara beau is indeed marvelous to behold. It is as if he had swathed himself in the solar spectrum.

A BLIND FORTUNE-TELLER OF KOKAND

He is a pebble prophet, reading the future by means of bits of stone and gravel instead of tea-leaves, coffee-grounds, or slate-writing. While his affliction is a commercial asset rather than a handicap, the natives believing that he can see the future more clearly by virtue of the fact that he is not distracted by the sight of mundane things, it must be a terrible cross not to be able to see one's self in raiment that rivals the colors of a glass marble. In the left background is a native cobbler at work.

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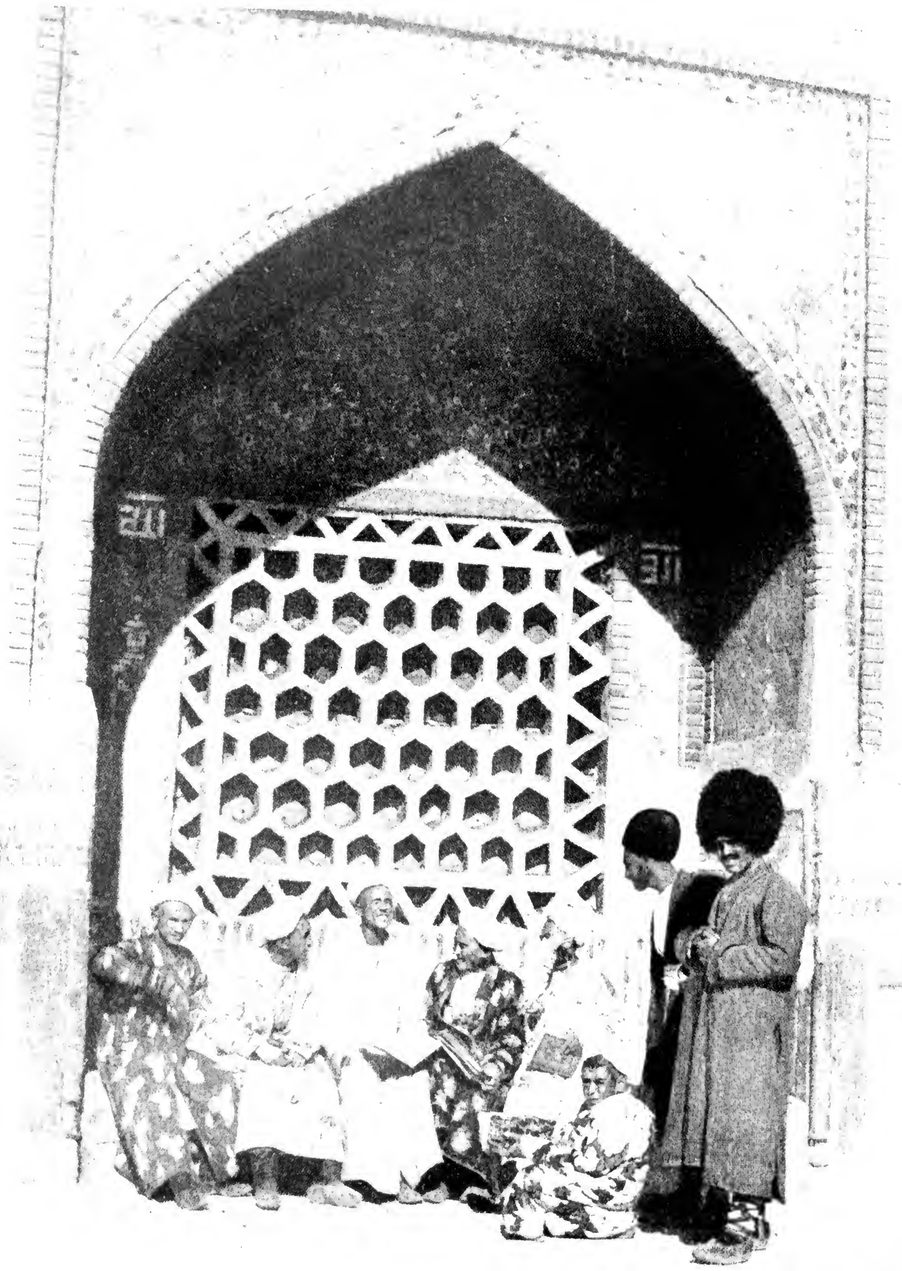
STUDYING THE MOHAMMEDAN SCRIPTURES

Bokhara is one of the world's great religious centers with its 364 mosques and its more than a hundred theological colleges. There is no quaker rule against color in the robes of its theologues, all of whom are seated. The individual standing at the right and wearing the ponderous sheepskin headgear is a Turkoman; his friend with the close-clipped cap is an Uzbeg.



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Retake of Preceding Frame

Merin's boy playing his fiddle at Tsagan Nor. Photograph reproduced by courtesy of the Central Asiatic Expedition

Two Mongolian Folk Songs[1]

By L. B. ROBERTS
Topographer of the Central Asiatic Expeditions

THE Mongols were singing again tonight, in a minor cadence, with constant repetition.

I asked Buckshot and Dalai Badajapoff to go with me to Merin's tent; for I felt that with these two as interpreters, I could arrive at a reasonable understanding of their songs. I recognized the tunes as the ones they have sung ever since they joined us at Shabarakh Usu. Sometimes they sing these for two or three hours steadily.

Merin's tent is larger than the average, about fourteen feet long, blue in color with good-luck symbols in clever scrolls worked into the sides with white cloth. Ten Mongol camel drivers call it home, as they eat and sleep there; they use no cots but spread their layer of felt on the ground, put their sheepskins at the edge of the tent for a wind break, and manage very well.

Merin, as chief of the caravan, had his usual seat of honor in the group, on

[1]An extract from the note book kept by Mr. Roberts while in the Gobi Desert during 1925.

WAR SONG

LOVE SONG

There was a wanderer,
Who wandered here and wandered there;
His helmet it was on his head,
It was upon his head. And

From the mountain he could see,
His native land, his native land,
And as he left his native land,
Each cheek it had a tear. And

As he looked from the mountain,
He saw a foreign land, saw a foreign land
And as he went into this land,
His sleeves were wet with tears. But

Always on his wanderings,
As he wandered here and wandered there,
He thought of wife and native land,
Of wife and native land.

a prayer rug which came from Tibet. With rare and quiet courtesy he asked me to sit in his place. The food, a terrible mixture, was being boiled in a big, open kettle at the entrance. The smoke, acrid and hard on the eyes, from the argol fire, filled the tent with weaving eddies; the interior was black and plenty dirty.

The wind was blowing hard outside, blowing sand against the tent; our only light was from a candle mounted on an empty Crisco tin. On a rope, stretched between the tent poles, was the meat of a sheep killed in the cool of the evening; blood kept dripping from it into the felt covering of the floor. The flickering shadows on the patient faces of the Mongols gave me a decided impression of primitive strength which seemed to harmonize with our surroundings. It is remarkable how these men resemble our Indians at home; I've seen some in Oklahoma and Arizona who might be blood brothers to them.

Merin is getting along in years; he must be at least sixty, I'm told, and his

Music amidst these desert surroundings is a serious business, calling for considerable concentration. Note clever use of discarded cornmeal tin and the pensive air of the camel. Photograph reproduced by courtesy of the Central Asiatic Expeditions

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face is lined and seamed from dealing, for so long a time, with weather and with men. As a rule he is very sober-minded, but he entered into the spirit of the occasion, and he, too, sang for me. All of these men have passed through bloody times.

Two of them played the instruments —one had a fiddle, the other a sort of guitar. They were rare instruments, and it seemed to me that it was a most remarkable thing that any tune whatever could be obtained from them. The guitar was held together with wire and string and yet it stood the strain quite well. The belly of the fiddle was a large corn meal tin; it had four strings and the method of producing different tones was peculiar, for the bow was slipped between the strings and the scale run by pressing the bow first against one string by a downward movement for one note and by an outward pressure against one of the other strings for the next note. The faces of the players showed absolutely no emotion—they played the monotonous strains over and over without a change of facial expression.

The complete stock of songs amounted to two distinct melodies—Dalai said at once that they were very, very old; were sung by the men who followed Ghengiz Khan. One appeared to be a war song and my efforts to get any translation met with complete failure. As I finally understood the matter, a foreigner broke into the yurt of a peaceable Mongol, stole his wife and sheep, so all good men should unite in driving out the foreign people. The melody, however, I was able to get on paper in a reasonably correct manner. The words evidently are made up and sung as they come to mind, the same methods used by the bards of ancient time.

I fared a bit better with the other melody, a love song; they sang it over and over again until I really had it; simple melodies both of them, but unforgettable.

Field & Stream - Jan 1932

My Philippine buck was small compared with our American deer

Hunting Among *the* Head-Hunters

A deer hunt in the forests of North Luzon

By MAJOR-GENERAL PAUL B. MALONE, U. S. A.

THE stars were still dimly twinkling over the mountain peaks of Nueva Vizcaya, Luzon, when old Juan Bontok stirred from his slumbers, readjusted his G string and, picking up a hollow bamboo water-tube, ambled slowly down a trail to a little stream which supplied water to the isolated group of Igorots of which he was a member. Juan lived in the "war zone," between the Ilongots and Igorots, enemies from time immemorial in the land of the head-hunters of northern Luzon.

The old man squatted on his haunches on a rock, dipping up in his cupped hands the cool liquid from the stream and sucking it noisily through his betel-stained, snaggled teeth. Juan was blissfully unconscious of danger.

Thirty paces distant, however, three lithe brown forms crouched in the cogon grass on the other side of the stream and watched the old man with a panther-like intensity. As he lapped the water they noiselessly arose. *Swish! Swish! Swish!* Three spears hurtled through the air with terrific force, and Juan Bontok's body, pierced through and through, toppled forward on the edge of the stream.

An hour later, Juan's tribal group found his headless trunk sprawled across the trail, his shoulders resting on the rock on which he had sat, his ebbing life blood tinting the down-stream current with crimson. Meanwhile a group of six head-hunting Ilongots raced back to their native village in the distant mountain tops from which they had come, Juan Bontok's head in their head-hunter's basket.

"And this occurred only about eight months ago," said Mr. King W. Chapman, American Superintendent of Education for the province of Nueva Vizcaya, as we sat together at his home at Bayombong in the Valley of the Cagayan in February, 1931.

"Head-hunting is a religious rite among the Ilongots and other head-hunters," said Mr. Chapman, "but the unsympathetic Philippine Constabulary treats this diversion as murder. A detachment of constabulary went up into the Ilongot country subsequent to the killing of Juan Bontok, and in the fight which ensued with a small group of Ilongots only a young girl escaped death."

That evening the girl herself was "introduced," a round-faced, demure miss, who, under the guidance of American teachers and her Christian Filipino associates, was attaining a "culture" comparable to that of her more favored companions of the lowlands.

It was late that night when Mr. and Mrs. Chapman had satiated their desire to discuss mutual experiences with one of their own race, and I learned that these two intrepid teachers planned to go up into the land of the head-hunting Ilongots and establish a public school for their benefit. After outlining the plan for reaching this benighted group with the blessings of modern education, Mr. Chapman added: "It is one of the finest hunting grounds to be found anywhere in the world. I can guarantee you a bag—deer, wild boar, wild carabao and even crocodiles. The river is full of them. Would you not like to go? Besides," said Mr. Chapman, "we might come into contact with a band of head-hunters, possibly the one which decapitated Juan Bontok."

THE suggestion was intriguing, but the trip would consume ten days—five days upstream to the headwaters of the Cagayan, two days of hunting, three days back over the rapids. It was impossible for me to spend that amount of time, but right there a bright idea came zooming through my brain. My youngest son, Lieut. A. J. Kerwin Malone, was an officer of the Air Corps, stationed at Nichols Field adjacent to my own post. Air reconnaissance of the valley was in progress; he had flown most of it already. Would it not be possible for him to pick me up and drop me into a field within one day's hike of the land of the head-hunting Ilongots,

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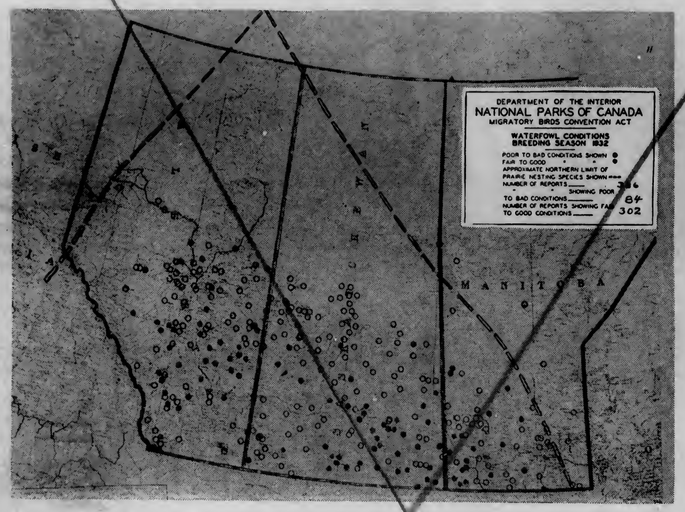
EDITORIAL

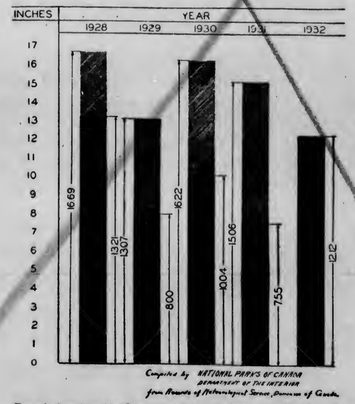
Ducks!

WILL Congress pass the Duck Stamp Bill? Leaders in both the House and the Senate think so; but unless every man interested writes those who represent him at Washington and demands the passage of this bill, it will fail to pass, not through opposition but through lack of militant support.

The 1932 duck season will have come and gone in many sections of the country before this magazine reaches the reader. As I write, in late October, I can only predict what the season holds in store. I must base such predictions on reports already received from our field representatives and correspondents in sections where the law is open and from information previously received from areas where waterfowl breed.



All signs point to much better shooting than was had in '31. Reports from the Canadian breeding grounds were most favorable. Two charts are printed on this page. The broken line in the top chart shows the approximate northern limit of the prairie-nesting waterfowl. The circles show sections where the waterfowl crop was fair to good. The black spots show poor to bad conditions. There are 302 circles, and 84 black spots. This is a great improvement over last year, when conditions in the same section were almost universally bad.



Precipitation in the provinces of Alberta, Saskatchewan and Manitoba during the years 1928, 1929, 1930, 1931 and 1932. Black in column indicates precipitation up to end of July in each year

The lower chart shows that the rainfall in this area in 1932, up to the end of July, almost equaled that of 1928 and exceeded the three drought years of 1929, 1930 and 1931.

At a meeting of the International Association of Game, Fish and Conservation Commissioners, held at Baltimore in September, Hoyes Lloyd, Supervisor of Wild Life Protection of Canada, reported that it was the belief of scientists who had been studying this matter that the recent drought period was broken and that the ducks will have nothing to worry about from that source for a while at least. Mr. Lloyd also stated that the 1932 duck crop on the Canadian prairies would far exceed the number of birds produced in the summer of '31, but perhaps would not equal the 1930 crop.

Reports which FIELD & STREAM has received from Northern States where the season has already opened are in most instances very encouraging. Some correspondents have gone so far as to put to use that old expression, "Best shooting we've had in years." That's fine! It's something to cheer about if, on account of the short season last year, coupled with bluebird weather, enough ducks returned to Canada to raise a bumper crop in 1932. May we continue to receive this same kind of report throughout the season from every section! But let's not rest on the oars because of a little good duck shooting. In the past the American sportsman has refused to become excited over game shortage until he has actually felt the disappointment of a closed season or an open season throughout which a fair bag could not be made.

Certainly we should all be intelligent enough to profit by our past experiences. We have seen the duck supply dwindling steadily throughout the years. The cause of this decrease has been principally the usurpation of resting, nesting and feeding areas by drainage; the enormous increase of gunners, and the disregard for restrictive laws.

I believe that any and every duck shooter is willing to give a dollar for ducks. The one-dollar Federal duck stamp plan, to secure money to care for and increase wild ducks and geese, has the endorsement of all those who will be called upon to put up the cash. It is only necessary for us to convince Congress of this fact.

I have been in close touch with all the movements to secure Federal legislation in connection with waterfowl. When good bills have not passed at Washington, it has been due to political opposition, and not because the constituents of Senators or Representatives have opposed such measures. Most lawmakers naturally oppose a new bill if they do not understand the need for its passage or if those whom they represent do not insist that they vote yes.

MAKE it a point now—today—to write both of your Senators and your Representative urging in the strongest language you can use that they work for the passage of the Duck Stamp Bill (S. 4726 in the Senate and H. R. 12246 in the House of Representatives).

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AT 9:45 A. M. we took the air and headed for the mountain tops that guard the west flank of the upper Cagayan Valley. Below to the east lay Rio Grande de Pampanga, to the west Rio Tarlac; in the far distance the church steeple of Tarlac was visible, well remembered because there in Tarlac General Aguinaldo had his headquarters in 1899 when the flooded streams and impassable roads of the rainy season arrested the farther advance of the American Army during the hectic days of the insurrection. The clouds hung thick about the mountain tops. We veered northward and climbed "over the top" south of Balete Pass. Far to the north lay the Gulf of Lingayan where the Wheaton Expedition, of which I was one small member, landed opposite San Fabian in the rear of the insurgent army in November, 1899. Every inch of the ground was pregnant with memories for those of us who carried the Star of Empire westward in those never-to-be-forgotten days. How marvelous now to be traveling through the clouds at 95 miles per hour in a 9,000-pound "monster bird," dreaming of the days when carabao speeds of thirty years ago were the maximum that we could attain through the jungles of Luzon.

Signaling from the cockpit, Lieutenant Malone indicated that we would turn into the cañon. I felt the plane nose down. Over the fusilage the cañon appeared. Down in the narrow gorge some miles away a clearing was visible; a white object indicated the landing place.

Round the narrow valley we zoomed and banked, while the terrified Ilongots fled in dismay, some falling deathly sick in anticipation of the end of the world for the Ilongot tribe. It seemed as though trees must punch their uppermost branches through the bottom of the ship; but suddenly we straightened out, the wheels touched ground, and we rolled bumpingly across the field to a halt, hopping a wild carabao wallow which we had not before discovered in the tall grass as we "dragged the field." "King Chapman Field" was added to the growing list of landing places, and a get-away with the kill was reasonably possible.

Mr. Chapman, after a five-day trip with his escort of about fifty Christian Filipinos and head-hunting Ilongots, awaited us. Curiosity having overcome fear and sickness, the Ilongots gathered about us, packed our baggage, and we took up the hike for camp, where Mrs. Chapman had her cook and houseboy preparing lunch and setting the table. Even a table-cloth was spread over an improvised bamboo dining table, and empty packing boxes placed around to serve as chairs for the "dining room."

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Dik-Dik, decapitator of a head, little Miss Sixteen and General Malone. Mr. Chapman (in the rear) thinks he can "educate" this tribe

Ilongots crowded about and furtively watched. About the left arms of some were tight, highly colored bands which Mr. Chapman explained were forced on over the elbow. Beneath the bands the skin was sore in many cases, but the bands are a mark of distinction and man must suffer for his pride. The hips of many of the men and the left arms of many of the women were encased in brass rings or bracelets. As compared to the brass for the making of these adornments, money is relatively of no value to these people.

All of these were non-Christians; all were head-hunters. To take a head confers tremendous distinction and generally leads to appointment as chief of a group. If a young man desires a girl in marriage, he can demonstrate his suitability as a husband in no better way than to lay at her feet the gory head of one of his victims. Was it part of this band that had taken the head of Juan Bontok and fought it out with the constabulary six months previously? Possibly, but exact identification of any group of nomadic Ilongots is rather difficult.

An hour of close-ups on a group like this is quite enough for one half day. Mr. Chapman suggested that the General desired fish for dinner. The leader assured the General that fish would be available "when the sun was there"—about an hour before sunset—and the group sauntered off along the river bed.

That afternoon about four o'clock we divided into groups and moved to points of vantage where we could watch for deer, hogs or wild carabaos as they might come out of the forest. Lieutenant Malone, the Chapmans and I formed one group, the rest of the party another. Two Filipinos went with us.

Dusk was just falling when the whisper, "Wild hogs!" went stealing from ear to ear. "Great big boar, big as a horse, only about five hundred yards away."

LIEUTENANT Malone, Mr. Chapman and I crept round the base of a hill and crawled, it seemed to me, halfway across the Ilongot country. Just as we got near enough to shoot, that wild boar must have detected perspiring Americanos, for he was gone like a shadow. An Ilongot would have walked up to the boar undetected; we were raw amateurs, incapable of stealthy approach, but we had a few moments of tense excitement.

Then over the hill came the relayed word from Mrs. Chapman, "Deer! Deer!" We crept laboriously back to the point we had

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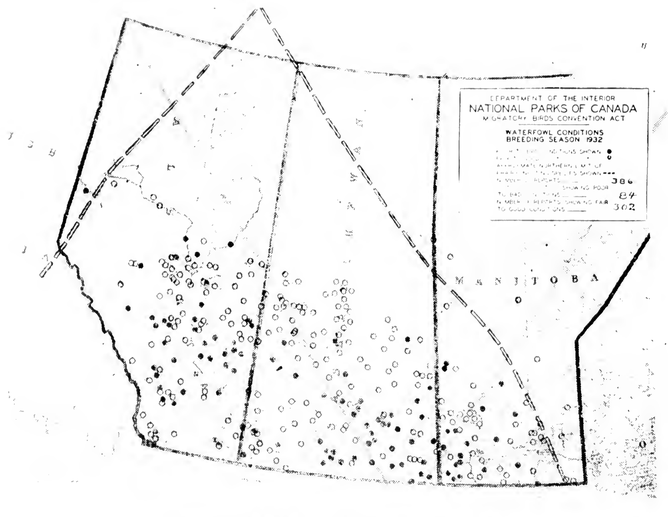

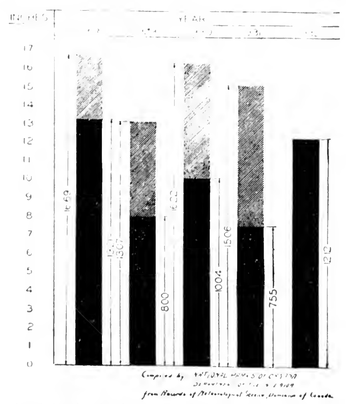

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Ilongots crowded about and furtively watched. About the left arms of some were tight, highly colored bands which Mr. Chapman explained were forced on over the elbow. Beneath the bands the skin was sore in many cases, but the bands are a mark of distinction and man must suffer for his pride. The hips of many of the men and the left arms of many of the women were encased in brass rings or bracelets. As compared to the brass for the making of these adornments, money is relatively of no value to these people.

All of these were non-Christians; all were head-hunters. To take a head confers tremendous distinction and generally leads to appointment as chief of a group. If a young man desires a girl in marriage, he can demonstrate his suitability as a husband in no better way than to lay at her feet the gory head of one of his victims. Was it part of this band that had taken the head of Juan Bontok and fought it out with the constabulary six months previously? Possibly, but exact identification of any group of nomadic Ilongots is rather difficult.

An hour of close-ups on a group like this is quite enough for one half day. Mr. Chapman suggested that the General desired fish for dinner. The leader assured the General that fish would be available "when the sun was there"—about an hour before sunset—and the group sauntered off along the river bed.

That afternoon about four o'clock we divided into groups and moved to points of vantage where we could watch for deer, hogs or wild carabaos as they might come out of the forest. Lieutenant Malone, the Chapmans and I formed one group, the rest of the party another. Two Filipinos went with us.

Dusk was just falling when the whisper, "Wild hogs!" went stealing from ear to ear. "Great big boar, big as a horse, only about five hundred yards away."

LIEUTENANT Malone, Mr. Chapman and I crept round the base of a hill and crawled, it seemed to me, halfway across the Ilongot country. Just as we got near enough to shoot, that wild boar must have detected perspiring Americanos, for he was gone like a shadow. An Ilongot would have walked up to the boar undetected; we were raw amateurs, incapable of stealthy approach, but we had a few moments of tense excitement.

Then over the hill came the relayed word from Mrs. Chapman, "Deer! Deer!" We crept laboriously back to the point we had

left. If one rifle had stayed, as Mr. Chapman recommended, we would have had a chance at a beautiful buck, but just before we got back to firing position our dripping bodies must have again conveyed a message of dismay to that beautiful buck. He snorted and darted back into the forest. Not a shot.

The sun was flinging the shadows of the mountain tops across the upper reaches of the Cagayan Valley when Mr. Chapman said we must split up, go toward the base of the adjacent hills and work slowly up against the wind toward the fringe of the forest. We agreed upon a rendezvous, and a Filipino guide was given me to lead me to the best possible point of vantage.

Just as dusk fell the guide close behind me seized me by the arm. "Deer! Deer!" I strained my eyes, but could see nothing. He pointed frantically over my shoulder. I scanned the dense underbrush and shook my head.

"No can see deer," I whispered stupidly.

Then, not more than seventy-five yards away, I beheld the merest stir of undergrowth and, concentrating my gaze upon it, ultimately saw the dim outline of a form.

I am not reporting how long it took me to squeeze that trigger in harmony with the instructions of the Infantry School and the Sandy Macnab method as the sights followed that stealthily moving figure behind the brush screen, but finally the gun went off. I looked round at the guide. I could not guess what had happened; he nodded his head approvingly. We literally crashed our way through the dense undergrowth, and there lay my deer.

The guide shouldered the buck, which weighed about fifty pounds, and we stumbled back to the rendezvous, heroes. No one else had got one.

Late that night we were back in camp and enjoyed a wonderful supper served upon the bamboo table by the light of candles stuck in a piece of bamboo.

WE stretched out, delightfully tired, on our cots. Along the edge of the river red eyes shone in the gleam of our flashlights—crocodiles in great number. We decided to get one later. A "croc" might decide for himself to crawl up the bank into our shelter and force the situation. Oh, well, let him come. An Ilongot might think it appropriate to get an Americano head to decorate his door-sill, but we should worry!

Morning. Cautious bathing in the river. Careful watching for crocs. No incident.

Louis, an Igorot boy, Christian pro tem, was preparing breakfast. Louis rated commander-in-chief on this expedition. When he proudly announced, *"Señora,* brekfest iss serv-ed," we seated ourselves on as many packing boxes as were available and enjoyed the finest bacon and fried fish one could get in any of the best hostelries of America.

The Ilongots had caught the fish and delivered them the night before. As we ate, the group that had caught the fish gathered under the leadership of their elderly chief, Tomingao, head-hunter extraordinary, and furtively watched every mouthful of food.

A NEW group of Ilongots, having heard of the "invasion," sauntered leisurely in as we ate. It was apparent that each group had an organization with chiefs and subordinates. This new chief, a young man named Dik-Dik, walked into the shelter of our tarpaulin which was spread over our mess table, and squatted on his heels, while his followers huddled together several feet away and watched.

"What makes him chief?" I asked Mr. Chapman. "He seems too young. Several of his group are much older than he."

"He has taken a head," said Mr. Chapman, and there, in the upper portion of his pierced ears, dangled rings and decorations which proclaimed him decapitator of at least one head.

"But that does not signify bravery," continued Mr. Chapman. "It merely means that he has chopped off a head. It might be the head of a woman or the head of a baby; a head is a head."

Mr. Chapman explained that head-hunting is frequently indulged in as a sport to break the monotony of existence. The compelling motive, however, seems to be to increase the productivity of pigs and chickens; insure the fertility of the women; miraculously expand the rice; protect from disease, pestilence and disaster, and in general call down the blessings of the gods upon the victorious community and turn the curses and the wrath of the gods upon the enemy.

Someone proposes a punitive expedition, and a group of from six to ten men, approximately an infantry squad, is organized for the purpose. It requires a little "war propaganda" to get a show started. This "war propaganda" includes three days of religious ceremony preceding the attack. The proposer, or some other, becomes the leader. Priests are summoned, and on the eve of departure the head-hunters, with the priests, assemble at the house of the leader. Sacrifices are offered to the gods of reproduction and the gods of war, and battle shields are painted with the blood of the sacrifices. The men constituting the expedition remain continent, sleeping beneath the house of the leader and eating only religious foods consisting of rice, chicken and pork.

The next morning the expedition starts. The members are armed with war knives, shields, sheaves of light bamboo spears about a foot long, sharpened at both ends, and a head basket resembling a knapsack

ONLY when the enemy appears in very inferior force, such as a lone individual, will the attack be launched. When Juan Bontok toppled over on the edge of the little stream to which he had come for water, his assailants rushed from cover. If custom was followed with ritualistic detail, the assailant who flung the fatal spear danced over the prostrate body, slashed the neck with his war knife, drew a finger through the victim's blood and sucked the blood from the finger. Juan's head was hacked off. The privilege of decapitation belongs to the man who hurls the fatal spear, but if more than one spear takes effect there is a wild scramble for the honor of taking the head.

The head carrier puts the severed head into the basket and the assailants make their get-away, shouting in derision as they go and flinging the short bamboo spears into the ground, inclining toward the enemy, to arrest pursuit.

"Such, in all probability, is the manner in which Juan Bontok was decapitated, and some of those around this table may have been parties to the killing," concluded Mr. Chapman.

"More fish and bacon, please," said I, "and another helping of French fried potatoes. I call this a unique and interesting breakfast."

It was difficult, however, to disregard the cataracts of betel-nut juice and repress curiosity concerning the possible composition of Chief Tomingao's betel-chewing outfit.

That day the natives staged a drive through the forest, threshing up the underbrush with long rattan-like whips, while baying dogs drove wild animals toward us from cover. We brought down two deer; but though wild carabao had during the (*Continued on page 57*)

In the Next Issue

"GOOSEBERRY BOB," by H. L. BETTEN. *A great story about a great hunting dog.*

"UP THEY COME THROUGH THE ICE," by JOHN KNOWLES GOWEN, JR. *The how and why of ice fishing.*

"THE OLD WARDEN ON FISH DUCKS," by HAROLD TITUS. *How many species of ducks eat fish?*

Every four years FIELD & STREAM *publishes a revision of its list of World's Record Fish—weights, where caught and by whom. You will wish to save this list from the February issue for reference.*

China 1891-1932

Including Tibet

C. Hart Merriam
Papers
BANC MSS
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Century Magazine, March 1891

THROUGH EASTERN TIBET AND CENTRAL CHINA.

JYÉKUNDO is a small town on an affluent of the Dré ch'u, and was the first place of any importance we had yet seen in Tibet. The town contains about a hundred and fifty houses, and a fine lamasery is built on a steep hill behind it. Here converge several important trade routes leading to all parts of the country. I purposed taking the one to Ch'amdo, and, as I had friends there among the lamas, I hoped to be able to push on southward towards Assam, or, if prevented and forced to return to China, I should at all events be able to add considerably to our geographical knowledge. From Jyékundo to Ch'amdo the country was unexplored, and the only Europeans who had gone from Bat'ang to Ch'amdo had not surveyed the route.[1] But fate and the lamas had something else in store for me. The first day of my stay in Jyékundo the yard in which I was camping was crowded with people of all ages and conditions, eager to see what goods I had for sale and to know what I wished to purchase; for, as I was not traveling on official business, trade was the only reason they could assign for my presence among them. Fortunately I bought enough tsamba and butter to last for a day or two, for on the morrow the courtyard was deserted, and I learned that the Déba, who was also abbot of the lamasery, considered me a suspicious character, because I was without the pass from the Amban at Hsi-ning with which all persons coming from the north are provided, and had issued orders forbidding trade with me. Any one disobeying was to be severely beaten, or, if a lama, his nose and ears were to be slit; and a reward of ten packages of tea was offered to informers. The people were told that these measures were taken for their protection, for it had been ascertained beyond a doubt that I was a man deeply versed in the black art, with power to make my money or other belongings return to me in three days after giving them in exchange for goods; to trade with me was therefore a sure means of bringing loss to traders and a great gain to me. This notice was duly posted all over the town, and lamas were sent to supply the people with verbal commentaries on the text. Just before the publication of this taboo I had bought a turquoise ring from the girl who owned the place where I was staying, and it was amusing to see her anxiety for the next three days. Each time I met her she clutched the little leather purse she carried at her belt and felt if the money was safe, and great was her relief when the dreaded time had elapsed and the rupees were still hers.

Fortunately for me there were in the town a number of Chinese traders from Ssu-ch'uan, and also a man from Hsi-ning who had been sent here by my friend the T'ung-shih to make ready a home for him and to await his arrival from Tendo, a town some four days' ride to the north of Jyékundo. These men did all in their power for me, and tried to dispel the suspicions of the lamas and the people. The man from Hsi-ning said I was a well-known T'ung-shih from Peking, as his chief, who would be here in a few days, would certify, and that any impoliteness to or ill treatment of me would be deeply resented by him and by the Chinese Government. This disturbed the Déba so much that he decided to go at once and consult with some other chiefs. As soon as he had gone my Chinese friends came and advised me to leave the town at once if I wished to cross Tibet, for as long as the Déba was away no new measures would be taken against me, and even his former orders would not be strictly obeyed. If I awaited his return it was possible that I would be forbidden to advance southward. My horses were so weak they could hardly stand and nobody would sell or hire me any. What was to be done? To leave two of my men here with all the goods, and to take the three best ponies and go as fast as they could carry me, was my only chance of getting through the country: the Chinese traders would try to send the other men and my traps back to China at the first opportunity. This was the conclusion we arrived at, and I decided to carry it out if my friends could get me a guide. After long *pourparlers*, and only on paying a large sum of money, did they finally secure the services of a man from Kanzé, a blear-eyed, drunken, wasted little fellow, who, besides his long, matted, grizzly locks, had a huge cue of different colored silks plaited with his hair, a concession to Chinese ideas frequently made by the Tibetans. He was to accompany me to his

1 Mgr. Tomine Desmazures and Abbé Desgodins, in 1861. Huc also traveled over this route on his way to China, but his narrative has no geographical value. Since writing the above I have learned, from a letter from Ta-chien-lu, dated May 24, 1890, that a party of thirteen foreigners (Gabriel Bonvalot and Prince Henry of Orleans?) had reached Larego, five hundred miles west of Ch'amdo, and was making its way to Ta-chien-lu.

and investigate. When the mate came close alongside he hailed again. Still no reply. She lay with her starboard beam towards us. He pulled around her stern and found the port gangway open. A man in a red shirt and a pair of trousers sat there on the deck, his legs hanging over the side. He was leaning back upon a box under his left arm, and a red handkerchief trailed from his right hand across his lap. A loud hail at close quarters brought no movement or response, and a sudden awe fell upon the boat's crew. The man was dead!

"The mate pulled forward to the bow and climbed up the chains to the deck. He said afterward that nothing would have hired him to climb into the gangway beside that silent figure. Four men lay on the deck around the forward hatch. They had been dead a long time, and the burning sun poured down upon ghastly bodies which were almost skeletons, they were so thin.

"The crew of the cutter were ordered up, and they searched the ship from stem to stern. They found no one in the forecastle or the hold, and no one in the cabin; but in the galley they found the Malay cook and the cabin-boy, both dead, the cook lying upon his face with his fingers twisted in his long black hair. All the men except the captain seemed to have died in agony, for their bodies were writhed and twisted.

"There was plenty of food aboard — a cask of salt beef, several hundred-weight of rice, and some flour. There were plenty of coals for the galley fire. The ship was perfectly sound, not a sail was split, not a halyard started; the masts and spars were all secure, and the wheel and rudder in good order. *But there was not a drop of water aboard.* Here was the secret of the tragedy. Every water-cask was dry, every butt had been upset and drained to the last drop. The little cabin-boy lay with his head and shoulders inside one of the overturned casks, and his stiff fingers grasped a tin cup into which he had been trying to drain a few drops of water.

"The ship's papers and two or three hundred Mexican dollars were in the despatch-box under the captain's elbow. I translated the papers — which were in Portuguese — when they were brought aboard the steamer. They showed that the brig was Portuguese, registered at Goa. Her name was the *Santa Maria*, and she had cleared from Goa three months before for a trading voyage along the west coast of India. Her master was also her owner; his name was signed to the papers with a cross. There was not, as it seemed, a single man on board who could write, for no log was found. There was a compass and a crude chart of the Indian coast in the cabin, but no sextant or chronometer and no signal-flags.

"So these poor wretches had probably been blown off the coast by a storm, and once out of sight of land they lost their bearings and could not find the way back again. Their supply of water gave out, and they died. But judging from the size of the brig, she required a crew of about fifteen men to handle her, and there were only seven bodies on board. What became of the others no one can tell. They may have drunk salt water, gone mad, and jumped into the sea to end their misery. There were lots of sharks swimming about the brig when we found her.

"I said there was no log on board. Perhaps that is true and perhaps it is not. On the deck by the captain's side was a little heap of pebbles which had evidently been brought up from the ballast, and carefully piled in one corner of the despatch-box beside the ship's papers were seventeen of these same pebbles. It is not unlikely that each pebble represented a day of thirst and watching. It makes me shudder, even now — the picture of that red-shirted captain sitting in the waist of the ship watching for a sail, and seeing his crew, maddened by thirst or by salt water, jump down one by one into the jaws of the sharks waiting below. I always think of that captain as catching sight of some steamer on the horizon and raising himself to wave his red handkerchief, his only signal of distress, then, as the steamer keeps on her course, falling back in despair — to die!"

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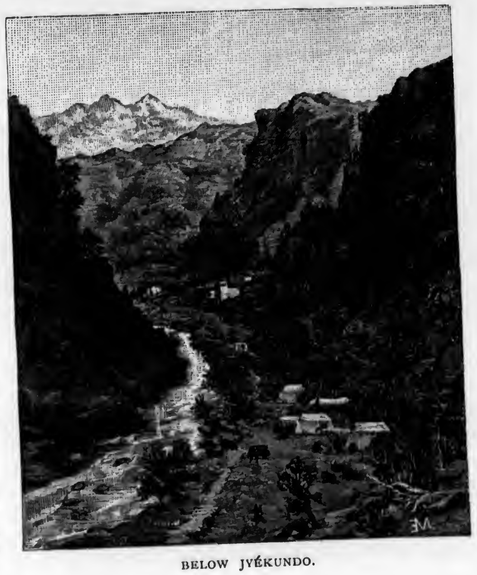

BELOW JYÉKUNDO.

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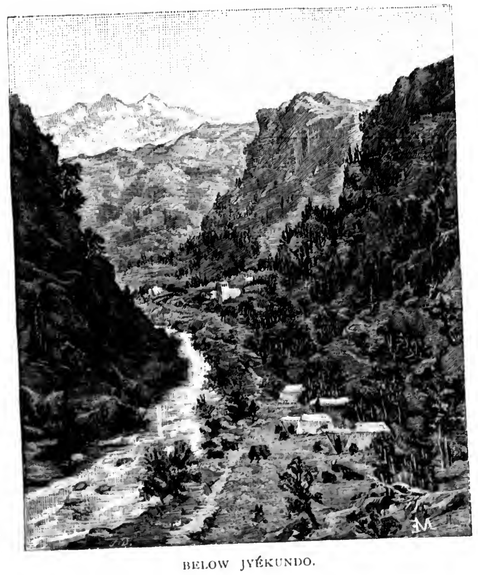

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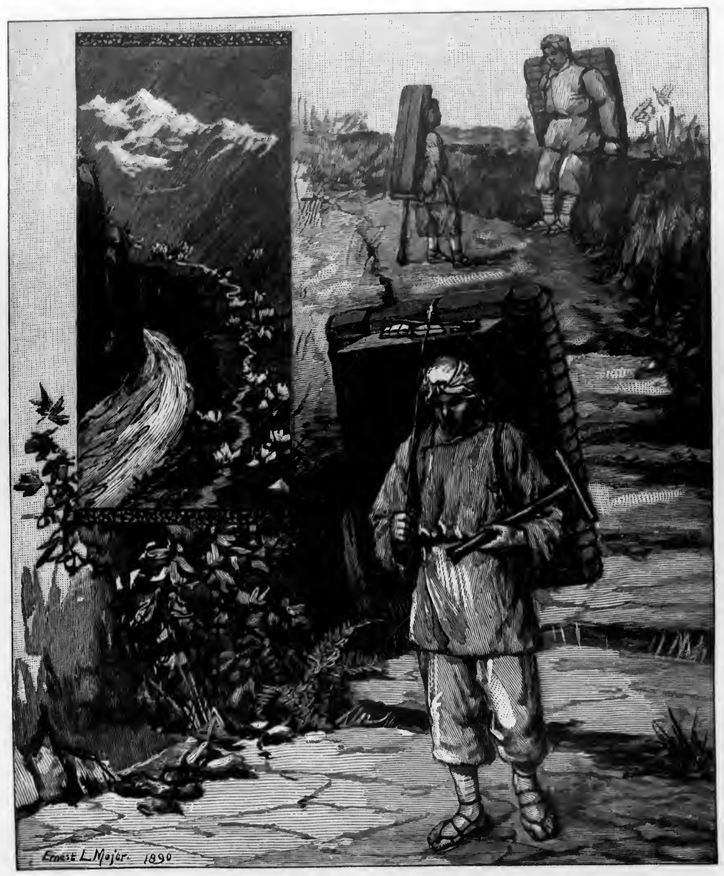

TEA PORTERS ON THE ROAD.

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We rode on rapidly, first crossing the Dré ch'u when three days distant from Jyékundo, and later one of its large affluents, the Za ch'u, our horses swimming, while we were ferried over in the little skin tubs used throughout Tibet. Rain fell every day and often for whole days, and our life was most miserable. Without fire or the possibility of preparing food, we wrapped ourselves in our felt cloaks and beguiled away the long hours of the night with a pipe as our only solace. When we had nearly reached the eastern border of Dérgé we and our horses were so utterly worn out that a day's rest was imperative. I rode up to a little camp on the hillside above the Yi ch'u and asked the people to let us rest in their tent for a day. They agreed to give us a small one where they stored pack-saddles, and we were soon seated around a big fire, emptying pot after pot of tea and milk with which they kept us freely supplied.

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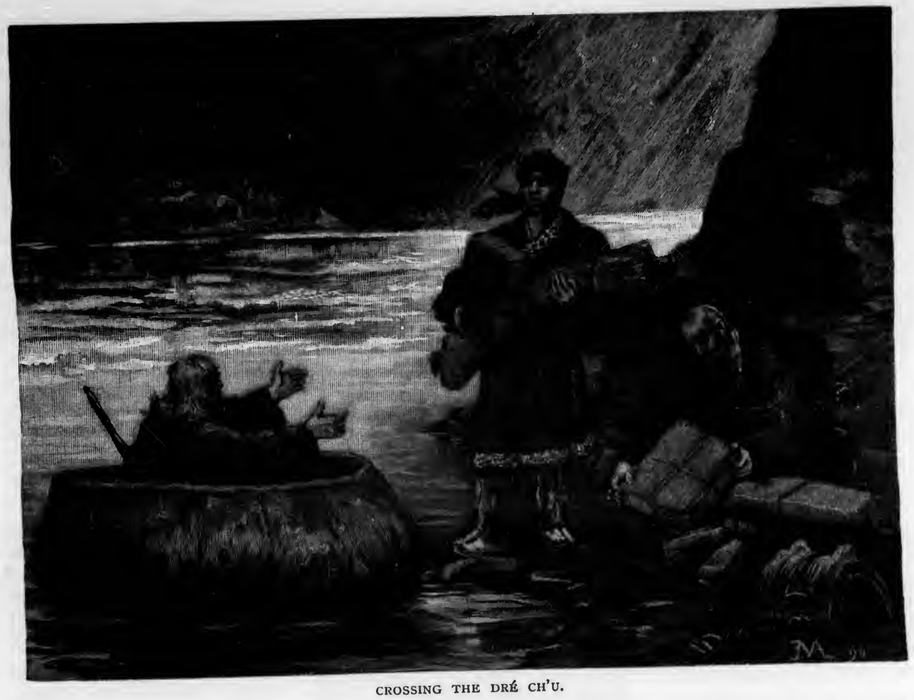

CROSSING THE DRÉ CH'U.

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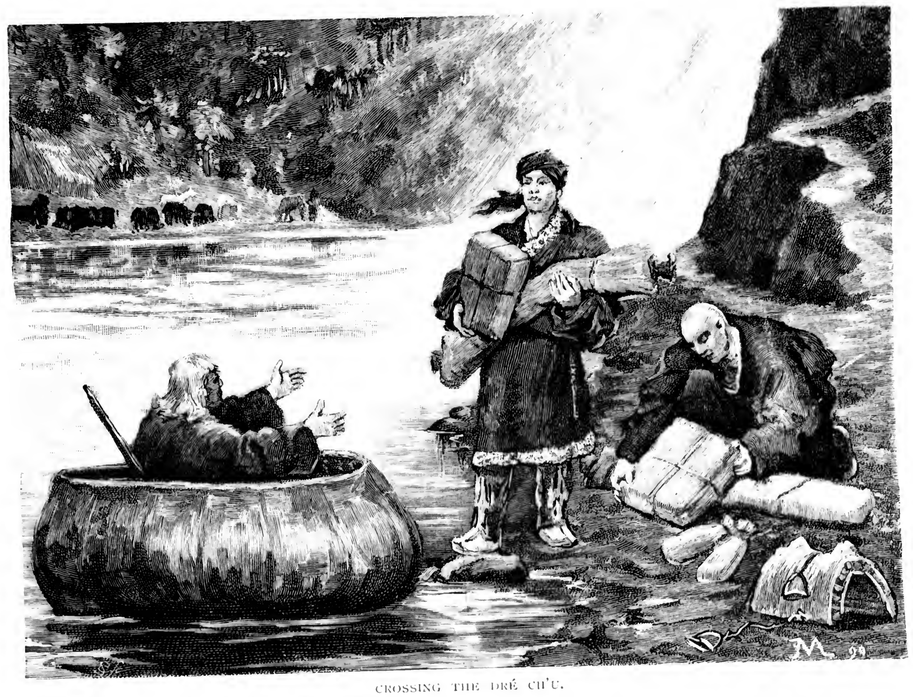

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I had arrived at Kanzé in an evil hour, in the midst of the festivities of the 15th of the fourth moon,[1] when the people from far and near congregate there and the chiefs review their men, and when drinking and fighting are the order of the day. In Tibet nearly every crime is punished by the imposition of a fine, and murder is by no means an expensive luxury. The fine varies according to the social standing of the victim, 120 bricks of tea (worth a rupee a brick) for one of the "upper ten," 80 bricks for a person of the middle classes, 40 bricks for a woman, and so on down to two or three for a pauper or a wandering foreigner, as Lieutenant Lu Ming-yang kindly informed me. He said that there was hardly a grown-up man in the country who had not a murder or two to his credit; and later on Mgr. Biet, the Bishop of Tibet, corroborated this statement.

AN EASTERN TIBETAN.

The Horba have finer features and lighter complexions than any other people I saw in Tibet, and their fondness for bright colors in dressing and for much finery adds not a little to their picturesque beauty. They are divided into five tribes, governed by hereditary chiefs, who are practically independent of both China and Lh'asa. The Déba appoint district magistrates (*Shelngo*), whose term of office is three years, and under them are war chiefs, or *Ma-pön*.[2] Each village has a *Bésé*, or "head man," who levies the taxes in his locality and is personally responsible for the payment of the full amount assessed. Other officers watch over the chief's granaries and crops, his herds and flocks, fix the date of the harvest, levy duties on salt and all other commodities. Tibetan officials never receive a money compensation for the performance of their duties, but are given certain prerogatives, such as the exclusive right to lodge caravans, and tracts of land are assigned to them the crops of which constitute their emolument.

Kanzé is the most important commercial center of this part of K'amdo. Easily and rapidly reached from Ta-chien-lu in Ssu-ch'uan, it is connected with the capital of Dérgé by a fairly good road. This latter place is famous for the beauty, excellence, and variety of its manufactures; its swords, guns, copperware, bells, and saddles command exceptionally high prices and are deservedly prized. I have seen specimens of work done in this locality which are highly creditable to the artistic sense and mechanical ability of the people. Art, like every other branch of the civilization of this country, has been affected by India and China to an equal extent, and the blending of the styles obtaining in these two countries as found in Tibetan metal work produces a most harmonious result. The Nepalese (*Peurbu*) are esteemed the best silversmiths in the country; and their work, which shows the Indian filigree and the Chinese repoussé combined, is imitated everywhere, and is a decided improvement on either of these styles of ornamentation used alone.

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We rode through several towns and by numerous villages till we finally reached our destination, Dawo, called Jésenyi by the people. It is quite an important place, with some eight hundred inhabitants, of which over a hundred are Chinese, and it has a large lamasery (*Nyichung gomba*) where live two to three thousand monks, held to be a churlish, riotous lot even by the people about them. Here I very nearly had a repetition of the scenes at Kanzé; but I was becoming hardened to anything short of actual assault, and as the mob did not go that far, I awaited quietly the arrival of the Chinese sergeant stationed here, who was rusticating some distance off in the mountains. When he finally came I got from him two guides, and we started for Kata (also called Tailing), and from that village off again to Ta-chien-lu, where I arrived on the 24th of June, having ridden nearly six hundred miles since leaving Jyékundo on the 29th of May. Here I found myself in the midst of friends; for the best could not have received me with more kindness and have done more to make me comfortable than did Mgr. Felix Biet, the noble Bishop of Diana and Apostolic Vicar of Tibet.

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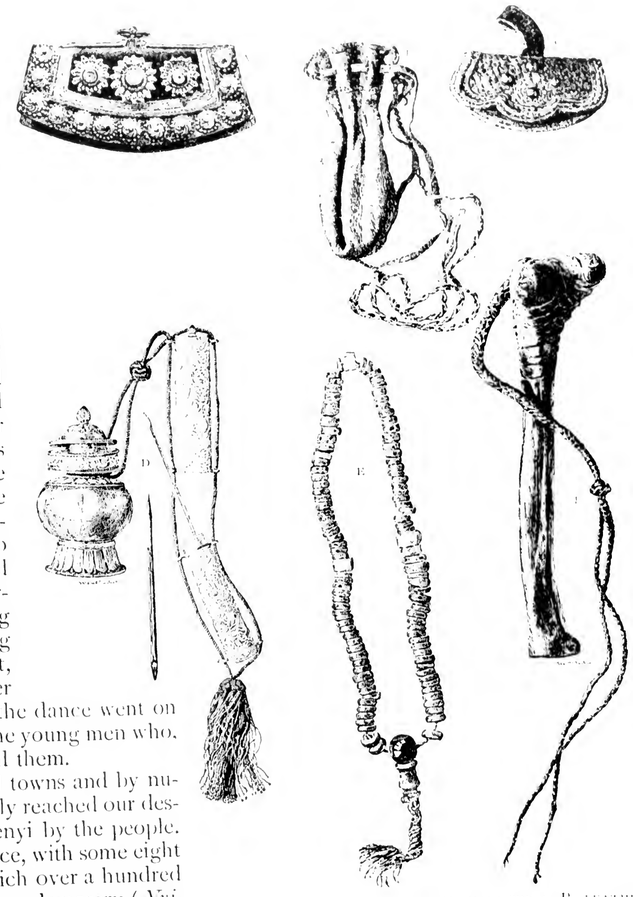

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to the sources of the Yellow River our routes, if not the same, at least frequently crossed each other. From the latter point to Ta-chien-lu, a distance of over seven hundred miles, I had traveled in a country where no European had ever put his foot. The richness and fertility of many of the districts I saw, the excellence of the roads, the absence of high or difficult passes between Jyékundo and Ta-chien-lu, the density and variety of the population, were subjects of continual surprise. These features alone explain the preference shown for this route by traders from central Tibet over the highroad *via* Lit'ang and Bat'ang. On the latter one has to cross no fewer than fourteen passes—several of them extremely difficult and very high—between Ta-chien-lu and Bat'ang, a distance of 225 miles, and the road lies nearly all the way to Ch'amdo (where the one I had followed meets it) through a desolate, thinly inhabited country, where it is difficult for a part of the year to find pasture for cattle.

BRONZE CHURCH BELL.

It is only within the last few years that the Chinese have been able to implant themselves in the country I traveled through, so hostile and lawless have the natives always shown themselves, but already an important trade has sprung up in musk, gold, hides, etc. Rhubarb (*Rheum palmatum*) of the finest quality is found in enormous quantities, but as its use is confined to the foreign market, there is no demand for it at present. It is highly probable that when the country is better known there will be found a number of products of the soil of considerable value to foreign merchants. The remoteness of this country will always be a great obstacle in the way of establishing direct commercial relations with it, and for long years to come it will probably be of interest to us only from a scientific point of view, a field of research of indeed wonderful interest to the student of anthropology, of linguistics, of geology, and especially of botany.

After passing a fortnight most agreeably at Ta-chien-lu waiting for the men I had left behind at Jyékundo, nothing being heard of them I made up my mind to go on to Shanghai. Comfortably ensconced in a sedan chair carried by four lusty coolies, I was off once more on the 10th of July for Ya-chou, which was the terminus of my wanderings by land.

We stopped the first night at Wa-ssu-k'ou, at the mouth of the Ta-chien-lu River (Lu ho) where it empties into the T'ung, the road running down a rocky gorge on each side of which the mountains rise almost perpendicularly to a height of over two thousand feet. Here and there huge boulders, detached from the cliffs, had been precipitated into the stream below, which tumbled over them in a mass of silvery spray. Wherever possible the soil was cultivated, maize and potatoes being the principal crops. Willows, poplars, and widespreading walnut trees were growing around the little villages and tea-houses with which the narrow, rocky path was lined. The road was covered with long files of heavily loaded porters trudging slowly on to Ta-chien-lu, and in every tea-house their huge loads were placed on benches while the frugal coolies refreshed themselves with a cup of tea or a bowl of bean-curd and a chunk of corn-bread. Most of them were carrying tea from Ya-chou or some neighboring town, about one hundred and fifty miles away, to be taken later, on yaks or mules, into Tibet. They were of all ages, and I was surprised to see among them not a few women and small children. The packages of tea, each about four feet long, six inches broad, and three to four thick, and weighing from seventeen to twenty-three pounds, are placed horizontally one above the other, the upper ones projecting so as to come over the porter's head. They are held tightly together by coir ropes and little bamboo stakes; straps, also of plaited coir ropes, pass over the porter's shoulders, while a little string fastened to the top of the load helps to balance the huge structure, which it requires more knack than strength to carry, for its weight must bear on all the back and only slightly on the shoulders.

SANDALS WORN IN SSU-CH'UAN.

In their hands the porters carry a short crutch which they place under the load when they wish to rest without removing it from their backs. The average load is nine packages, or from 190 to 200 pounds, but I passed a number of men carrying seventeen packages, and one had twenty-one. A man, I was told, had a few years ago brought an iron safe weighing four hundred pounds for Mgr. Biet from Ya-chou to Ta-chien-lu in twenty-two days. Old or decrepit people commonly travel along this road borne on the backs of porters. Many of the women porters carried seven packages of tea, nearly two hundred pounds, and

TIBETAN BOOTS FOR MEN AND WOMEN.

children of five and six trudged on behind their parents with one or two. The price paid for this work is twenty tael cents (about twenty-five cents) a package, and it takes about seventeen days to make the trip from Ya-chou. So far as my knowledge goes there are no porters in any other part of the world who carry such weights as these Ya-chou tea-coolies; and, strange as it may appear, they are not very muscular, and over half of them are confirmed opium smokers.

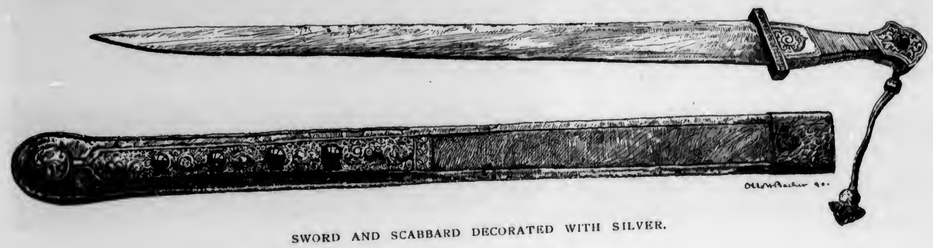
Irish potatoes, I have said, are one of the principal articles of diet at and around Ta-chien-lu, but in 1889 the crop was nearly a total failure; the potatoes rotted in the ground, and the poor people were greatly distressed over this inexplicable and unprecedented calamity. A day or two before I left town the mystery was explained. A peasant, while resting from his work in his little potato patch, heard the voice of the "chief of the potatoes" (*Yang-yao wa-wa*) as he spoke to his people, saying: "My children, this people of Ta-chien-lu are a stiff-necked, wicked lot, and I have felt it my duty to punish them, and not to leave you exposed to their contaminating influence, so we will all leave this country and seek another home. But as I don't wish the death of these sinners, but rather that they may repent and live, I have ordered our cousins the beans to remain behind, and so they will not starve."

The peasant came at once to town and repeated his story, which partly consoled the people for their loss, for they then knew that if the potato crop was to be a complete failure they would at least have an abundance of beans.

Some fifteen miles below Wa-ssŭ-k'ou is the famous suspension bridge across the T'ung River, the Lu-ting ch'iao. It was built in 1701, and is 370 feet long, 10 feet broad, and is, I should think, about 150 feet above the stream. Nine chains, which form the bed of the bridge, are wound around large windlasses placed in towers at each end, and by this simple method the bridge is kept taut and the swinging reduced to a minimum. Two other chains on each side form a rather frail fender, and two loose planks placed on the lower chains constitute the roadway, over which mules and horses can travel with ease if not with a sense of perfect security.

Ssu-ch'uan and Yun-nan are famous for their suspension bridges, most of them similar to the Lu-ting bridge; one, however, that I saw near Huang-ni P'u is made of two round bars of iron and is about seventy-five feet long. How it was manufactured or put in place is a mystery to me, but it is a splendid piece of ironwork. The extremities of the rods are anchored behind large rocks.

About half a mile below the village of Lu-ting ch'iao the Catholic Tibetan mission has a station in the village of Sha-pa, and here I passed the night in the neat little vicarage surrounded by peach and pomelo,



SWORD AND SCABBARD DECORATED WITH SILVER.

SILVER CHATELAINE, SILVER-MOUNTED KNIFE, SEAL AND SEALING-WAX.

lemon[1] and plum trees laden with fruit, and a garden filled with salad plants and other vegetables dear to all good Frenchmen.

The following day we left the valley of the T'ung ho and by rough and steep paths reached the top of the Fei-yüeh ling (altitude 9400 feet), and on the 13th the pretty little town of Ni-t'ou. The people were in a state of excitement over the marriage of the belle of the place and the high price her prospective husband had had to pay for her: fifty taels to purchase a "number two wife" was highly creditable to the town which had given birth to such a treasure. The Ssu-ch'uanese are much given to selling girls, and large numbers are exported yearly from Ch'ung-ch'ing for Han-kou and Shanghai and other eastern cities. The price usually paid for one of six or seven years is from seven to ten taels. They are kindly reared by the stock farmer who buys them, receive a "liberal education with all modern accomplishments," and when they have attained the age of sixteen are easily disposed of at high prices. The trade has nothing cruel about it, and many of these girls are respected members of society in after life, and certainly enjoy many more material comforts than if they had been left in their poor villages. I have lived in homes of highly respectable Chinese where the wife had four or five little girls purchased with her savings, and they were treated with as much kindness and love as her own children.

At Yung-ching Hsien (altitude 3100 feet) tea culture begins, but unless particular inquiries on the subject are made one would not be likely to recognize the tea shrub of China in the trees, fifteen or twenty feet high, which bordered the fields, or in the heaps of big leaves and twigs drying in the sun the components of the brick tea of Tibet.

In a little village some ten miles below this town, and where I stopped for the night, my rest was much disturbed until nearly dawn by some one reciting in the peculiarly exasperating monotone in which all Chinese schoolboys are wont to indulge. On inquiry I learned that it was the innkeeper's son, preparing to go up to town for his examination for the degree of B. A.; and the innkeeper said that he and all the men of his family for the last three generations had passed this examination. This is a little village lost in the remote mountains of western Ssu-ch'uan: I doubt if such a thing could be heard of outside of China, Korea, and Japan; but in these countries it is common enough. On July 18 I reached Ya-chou, a pretty city on the right bank of the broad Ya River, which empties into the Fu ho (or, as we call it, the Min) at Chia-ting Fu. Besides being the greatest manufactory of brick tea in Ssu-ch'uan, Ya-chou is also the rainiest place in the province, while Yung-ching, not forty miles from it, is said to be the driest. The summer of 1889 had been exceptionally rainy, even for Ya-chou, and the authorities had been forced to take drastic measures to stop the deluge. They had had the north gate of the city closed! This was known to be an infallible means of putting a stop to the rain, and the people were delighted with the energy and determination of their chief magistrate in dealing with the rain gods.

At Ya-chou I hired a raft to take me down to Chia-ting, seventy miles. This is the only kind of craft which can navigate the shallow but swift and dangerous Ya ho. It is about thirty feet long and six wide, and is built of two sets of bamboo poles, the forward set bent up into a bow. A mat awning covers the middle of the raft, and two men row in the bow while one steers with a long sweep in the stern. It is a tolerably safe, rapid, but wet mode of travel. As cooking and sleeping on board are impossible, it is not to be recommended when ascending the river.

A RAFT ON THE YA HO.

[1] Pomeloes (or *shaddocks*, as they are called in the West Indies) and lemons do not, however, reach maturity at this altitude (4500 feet).

The swift current carried us rapidly down through a country of great natural beauty. On each side the red sandstone of the mountains cropped out in numerous places among the vivid greens of the semi-tropical vegetation which covers the soil, while in the background rose the dark cloud-capped mountains I had recently been traveling across. The lowlands along the river were, wherever irrigation was possible, covered with paddy-fields; near every little white and black cottage a bunch of tall bamboo waved its long, graceful plumes, and banana, white-wax, and tea trees, with fields of sorghum and maize, nearly hid them from our view.

Some fifteen miles below the town we passed through a gorge about two miles long; creepers and ferns grew in every crevice of the high red sandstone cliffs rising on each side, and two torrents fell in dazzling mist from a height of several hundred feet over their perpendicular sides, and at their base the river swept over the rocks, spinning our frail craft in the whirlpools which covered its turgid surface.

The next morning we could see some thirty miles away to the west the dark, rugged mass of sacred O-mi shan, rising ten thousand feet above the plain, and a few miles ahead were the vine-covered walls of Chia-ting and its suburbs of thatched cottages hid in groves of bamboo and banana trees.

Here I staid only a day, the necessary time to hire a small boat to take me to Ch'ung-ch'ing (287 miles), where I arrived in two days, simply drifting with the current. The country between Chia-ting and Ch'ung-ch'ing was similar to that along the Ya ho, the valleys a little broader, the hills lower and less angular. From Sui Fu — where we entered the Yang-tzu — eastward the country has already been carefully described by former travelers, and the pace at which I was swept through it was not suited to collecting further details concerning it. But what struck me everywhere in Ssu-ch'uan was the prosperous appearance of the people in this the most densely populated province of the empire. It is said that there are 71,000,000 inhabitants in Ssu-ch'uan,[1] and I have seen less misery and less beggary in it than in any other province. The people are well dressed, well fed, happy, and hard-working, and famines in this garden-land are unheard-of calamities. Notwithstanding its teeming population it not only produces enough to supply its people with food, but its foreign trade in tea, silk, opium, medicines, etc. enriches its merchants and brings it all the products of other provinces and distant countries.

After staying at Ch'ung-ch'ing for ten days, the river being so high that no boatman would risk going down it, I left on August 4 for I-ch'ang (415 miles). Below Kuei-Chou (the border town of Ssu-ch'uan, and about 290 miles east of it) we entered the famous gorges of the Yang-tzu, where the great river is hemmed in in a narrow passage by masses of rock rising perpendicularly to over a thousand feet along each bank for miles at a time, and dashes along seething and eddying, hurrying eastward to be free. Here the skill of the helmsman came into play as he steered with unerring precision our cockleshell of a boat around the whirlpools, and by the rocks whose jagged points now and then jutted out of the river as when in the vortex of some larger eddy they could be seen for an instant. Once only did his hand err, and we at once were flying around helplessly like Jules Verne's *Nautilus* in the Malestrom. Dazed and sick from the rapidity of the motion, we crouched down in the bottom of the boat, which creaked and cracked and rolled as if about to capsize. After a minute or so the whirling slackened a little, and the men, seeing the whirlpool receding, bent their oars with a great shout and safely got us out. Had the bow of the boat got into the vortex and not across it, as it fortunately did, it certainly would have been swamped.

We passed heavily laden junks slowly working their way upstream amidst what to any but the Chinese would have appeared insurmountable difficulties. A hundred naked, shouting, and arm-swinging trackers dragged each one slowly along, now straining every muscle at the long tow-line, now slacking up as a man seated at the bow of the boat directed them with the beat of a small drum held between his knees. Below the rapids other junks were preparing to enter them with much burning of joss-paper and firing of crackers, and near by was a little lifeboat station, with two or three "red boats" ready to pick up any one in case of accident. Below all of the rapids on the Yang-tzu are lifeboat stations, which, like many other charities in China, are kept up solely by private subscription and render the greatest service to the enormous population employed on the river.[2]

And so I traveled rapidly on, stopping at night at some town or village to buy food and

[1] Memorandum of the Board of Works (*Hu-pu*), giving the population of the empire in 1885. Manuscript note to the author.

[2] I have seen recently in a paper that the Chinese ignore charity, that they have no charitable institutions, etc. Such ignorance is unpardonable even among a people as grossly prejudiced against the Chinese as we are. A volume could be written about the charitable institutions of China, of the soup-houses, orphanages, schools, refuges, etc. in every town and village of the empire, but *cui bono?* Something else would be found with which to reproach the "Mongolian."

to wait for daylight in order to continue my journey. Between the different gorges (there are five principal ones) the country was very beautiful; here and there some little valley opened on the river and far away I could see high, pine clad hills. Villages hid in the foliage of bastard banyans and other widespreading shade trees occupied every level bit of land, many even built against the steep face of the hills overhanging the river. Frequently we saw the wreck of some unfortunate boat, or one less unlucky beached, its crew busily occupied in removing the cargo or repairing its battered hull.

The rapidity of the current when the river is in flood can be conceived from the fact that my boat reached I-ch'ang in fifty-seven hours, the total distance, as before stated, being 415 miles. The question of steam navigation on this mill-race is one interesting a large proportion of the foreign community in China, and I have read and heard a great deal about its feasibility. That a small steamer might, after great labor, be got up to Ch'ung-ch'ing, I believe is possible, but that regular remunerative steam navigation could be established is another question; and if only boats similar to the one built a few years ago to attempt the ascent are used, I believe it will be a very long time before Ch'ung-ch'ing will hear the lively steamer's whistle.

At I-ch'ang my boat journey was at an end, and here also, as far as my readers are concerned, ceases all interest in my wanderings of over 4500 odd miles in the Chinese Empire.

W. Woodville Rockhill.

THE UTOPIAN POINTER.

COLONEL CLACK, Pompey Clack, the tavern-keeper at Sparty, or, as the learned called it, Sparta, belonged to that well-distributed type of individuals the chief, almost the sole, aim of whose life seems to be to impress the world with the sense of their own importance, and who somehow never advance one iota towards the desired end. With this purpose he invariably opposed everybody in everything; was always going against the current. What had been said of a worthier man was repeated of him, that if he were drowned it would be necessary to dredge upstream to find his body. Not even the ninth commandment, nor, as to that, a whole decalogue, could bar him from surpassing his neighbors in all things, from the size of a pumpkin or turnip to the width of his reputation as a landlord, or the number of his aristocratic friends. Doubtless some part of our worthy's unpopularity sprang from a more venial sin — the habit of advice-giving; for when was the giver of advice, especially if it be good advice, ever popular?

At any rate, not even his title — and that was before the day in which colonels cut the figure in the census that they now do, but when a title, even if acquired in the militia, threw a kind of halo around a man — could in any measure give him either the respect or the esteem of his fellow-men.

A ripple, almost a wave, ran through the quiet life of the place — for next to practical jokes dullness was the chief product of Sparta — when it was known one day that General Lark, an immensely wealthy friend of Colonel Clack's, had sent on a fine dog, intending himself to follow in a few weeks for the fall shooting. The dust of the departing stage was hardly laid before the colonel had apprised the whole town of the event down to the minutest particular.

When a new rope had been secured and the dog made fast to the big aspen in the tavern back yard the town was invited around to look at a rich man's dog and see him eat. The bill of fare had been rigidly prescribed by the general, and there was to be no stint of it. For that breed of pointers, it was explained, were liberal, very liberal feeders, and to stint one in the least was to spoil his hunting qualities forever.

Colonel Clack was a close, an exceedingly close man, but this guest at least never knew it. The mountains of saleratus biscuit, fried ham and eggs, and chicken pie which that small animal caused to vanish were worthy of a place in history. It looked like magic.

"Blessed if his hide would hold half of it," muttered a bystander.

"Where do Utopian pointers come f'om, anyhow?" asked another.

"Oh, from Utopia, of course," was the colonel's patronizing reply.

"But where's Utopia? 'Tain't in no geography I studied," went on the inquisitor.

"Utopia! Why, Utopia 's in — ahem — why, Utopia, you know, 's in the old country. There must have been a leaf out of your geography. My friend General Lark's estates are all in Utopia. In fact, I reckon he owns about half the country, from what I can hear, though he ain't none of your bragging men."

All of the dog's fine points, his length and sharpness of nose, his wealth of ears, tail, and

Andrew's Asiatic Zool. Exped.

With the outbreak of the war Professor Clarke became actively interested in problems of defense and economic preparedness. He was appointed a member of the National Research Council and was chairman of the subcommittee on road materials and a member of the committee on camp sites and water supplies. He was also chairman of the committee on highways and natural resources of the Maryland Council of Defense.

Professor Clarke made numerous contributions to geological literature, his work being confined largely to the Cretaceous and Tertiary formations of the Atlantic Coastal Plain and the Carboniferous deposits of the central Appalachian region. Professor Clarke's chief paleontological interest was centered in the Echinoidea, to the elucidation of which group he published several monographs. One of his monuments will be the series of reports of the Maryland Geological Survey, which set a new standard for state publications both as to subject-matter and book-making. The systematic reports in which he was most interested will be of perennial service to science.

He was a member of numerous clubs including the University, Maryland, of which he was a vice-president, Baltimore Country, Johns Hopkins, and City Clubs of Baltimore and the Cosmos Club of Washington.

He was married October 12, 1892, to Ellen Clarke Strong, daughter of the late Edward A. Strong, of Boston, and had four children, Edward Strong, Helen, who was recently married to Captain H. Findlay French, Atherton and Marion, all of whom survive him.

Professor Clarke's administrative ability and professional attainments are largely responsible for the extensive development of Maryland's mineral resources and his loss will be severely felt in all quarters. He was always keenly interested in the educational value of the work of the various state bureaus which he directed and had just finished writing a geography of Maryland for school teachers. At the time of his death he was engaged in writing a report on the underground waters of the state and another on the coals.

Aug 3, 1917

SCIENTIFIC EVENTS

THE ASIATIC ZOOLOGICAL EXPEDITION OF THE AMERICAN MUSEUM OF NATURAL HISTORY

Dr. Henry Fairfield Osborn, president of the museum, has received news from Mr. Roy C. Andrews, who is in charge of the expedition. The principal work of the expedition was done in remote regions of the province of Yunnan, China, where no white man had ever been seen before the explorer and his party entered that region. Mr. Andrews is accompanied by Mrs. Andrews, who is the official photographer of the expedition. The party, since it has been in Yunnan, has ridden 2,000 miles on horseback and made camps in 107 different localities varying from 1,700 to 15,000 feet above the level of the sea. Mr. Andrews says in his report, which is dated at Hui-Yao, May 23, 1917:

The active field work of the expedition ceases to-morrow, exactly one year since it began by our first trip up the Min River from Foochow—a trip which was interrupted rather seriously by the rebellion, but which gave us some very interesting experiences. We have as results the following: 2,100 mammals, 800 birds, 200 reptiles, 75 skeletons of mammals, 8,000 feet of motion-picture film, 150 Paget natural color photographs, 300 black and white negatives. Our attention to the subject of mammals has, I believe, yielded the largest collection ever taken out of China by a single expedition. We visited first the northern alpine country along the Thibetan frontier where we were seldom below an altitude of 9,000 feet and collected as high as 15,000 feet. The mountains among which we were working were tremendous, reaching as high as 18,000 feet. In this region we were frequently with natives who had never seen a white person. The northern trip occupied some four months and we then started on a long journey southward to the Burma border where we collected in regions only 1,700 feet above sea level, where, of course, we found a totally different fauna. Thus the collection covers a wide range of climate as well as actual distance. Our large mammals include seven gorals (*Nemorhacdus*) from the Thibetan region and four serows (*Nemorhacdus*) —all complete with accessory material for group mounting. On the Burma frontier we collected twenty-five gorals—a perfectly splendid series, all from one mountain and of all possible ages from just born, young to very old males and females.

expended, however, by the State Geological Survey in the supervision and building of roads up to the date of the transfer.

Under an Act of the Legislature passed in 1900 Professor Clarke was appointed commissioner for Maryland by the governor to represent the state in the resurvey of the Maryland-Pennsylvania boundary, commonly known as the Mason and Dixon line. This survey was completed four years later and an elaborate report prepared. In 1906 he was made a member of the Maryland State Board of Forestry and elected as its executive officer, which position he held at the time of his death. The governor appointed him in 1908 a member of the State Conservation Commission.

Professor Clarke organized and directed the preparation of the official state exhibits of Maryland mineral resources at the Buffalo, Charleston, St. Louis, Jamestown, and San Francisco expositions in 1901, 1902, 1904, 1907, and 1915. These exhibits attracted much attention at the time and received a large number of conspicuous awards. These exhibits have been permanently installed as a state mineral exhibit at the state house in Annapolis.

When President Roosevelt invited the governors of the states to a conference on conservation at the White House in May, 1908, it was arranged that each governor should appoint three advisers to accompany him. Professor Clark was one of the Maryland advisers and took part in the conference.

After the great Baltimore fire in 1904 the mayor of the city appointed Professor Clarke a member of an emergency committee to prepare plans for the rehabilitation of the burnt district and for several months he served as vice-chairman of the important subcommittee on streets, parks, and docks whose plans resulted in the great changes subsequently carried out. The following year he was appointed by the mayor a member of a committee to devise a plan for a sewerage system for the city which has resulted in the building of the present modern system of sewers. Again in 1909 the mayor also appointed him a member of a committee for devising a plan for the development of a civic center for Baltimore.

Since 1901 Professor Clark has been president of the Henry Watson Children's Aid Society of Baltimore and was a delegate to the White House Conference called by President Roosevelt in February, 1909, to consider the subject of the dependent child. He was also a member of the executive committee of the State Tuberculosis Association and a vice-president and chairman of the executive committee of the federated charities of Baltimore.

Numerous scientific societies have elected him to membership, among them the National Academy of Science, of which he was chairman of the Geological Section, the American Philosophical Society, the Philadelphia Academy of Natural Sciences, the American Academy of Arts and Sciences, the Deutsche Geologische Gesellschaft, the Washington Academy of Science, Paleontologische Gesellschaft, and the American Association for the Advancement of Science. He was councillor and treasurer of the Geological Society of America at the time of his death. In 1904 he was elected a foreign correspondent of the Geological Society of London. He was also president of the Association of State Geologists. Amherst conferred on him the degree of LL.D. in 1908. He had numerous offers from other institutions, perhaps the most important being the professorship and head of the department of geology at Harvard University, but all of these were refused, and his devotion to Hopkins and the ideals for which it stood was unswerving.

At the time of the International Geological Congress in St. Petersburg in 1897 Professor Clarke was an official delegate from the United States and spent several months in an extended trip through Russia and its provinces. In 1906 he spent the summer on an expedition to central Alaska, visiting the region to the north of Prince William Sound. He traveled extensively in western America and Mexico, reaching distant portions of the western Sierra Madre district.

I do not hesitate in saying that this is the finest series of these rare animals in any museum of the world. It is quite a different species from those we shot in the north. A few days ago I had the good fortune to shoot a splendid coal-black serow—an animal quite unlike the serows of the Thibetan border and exceedingly rare in this region. We have also arranged to buy a fine male serow from Fukien Province. This gives us six of these strange animals of three different species. We have a very large sambur (*Rusa*) stag in perfect mountable condition, ten red barking deer (*Cervulus*) and two of the very rare blue, or crested, muntjacs (*Elaphodus*). The collection contains twenty-five monkeys of five species and four genera. Two species of gibbons (*Hylobates*), one very small yellow one, and another large black variety, as well as eleven large gray monkeys (*Semnopithecus*) of all ages and sexes. Six or seven baboons of two species. Of medium-sized carnivores we have about 50—especially Viverrines, and one fine leopard.

The large mammals of this province, as indeed throughout all China, are by no means abundant, and are in widely separated districts, so that we feel we have a fairly good proportion. The collection of small mammals is especially rich in Insectivores, and I believe that some remarkable types will be found among them.

The collection of skeletons comprises all species of large or medium sized mammals, and specimens of each species of small mammal in formalin. Also fœtal examples of gibbon, goral, muntjac, langur, baboon, etc., in formalin.

We collected birds whenever we were not occupied with mammals and during our long journeys between collecting points. About one third of the collection is from Fukien Province and the remainder from Yunnan.

Neither Mr. Heller nor myself has ever been in such a poor reptile country. Some five months of the trip, while we were in the north, the weather was so cold that no reptiles at all were to be found. Those we have collected were mostly taken during the few months of our southern trip.

The photography of the expedition will, I believe, prove of extraordinary value and interest, comprising, as it does, motion film, natural color and black and white negatives. The Paget color plates will be especially interesting, and have not, I believe, ever been used upon an expedition of this character before. The motion film shows the general life of the people along the Thibetan border and in the far south, and, since it was developed in the field, the success of the film, from a technical standpoint, is assured.

We have met with the greatest courtesy from all officials with whom we have come in contact. The Chinese government has granted willingly every request which we have made, and French and British officials have given us free entry of goods, reduced freight rates and assisted in various other ways.

Mr. Andrews will leave Mr. Heller at Bhamo and proceed to Calcutta, where he expects to spend a week or ten days at the museum comparing a selected series of his collection of small mammals with those obtained by the Anderson Yunnan Expedition in 1875—the only other expedition which has ever collected in that province. He will then go to Colombo and tranship for Hong Kong—a journey of twenty days or more. From Hong Kong, Mr. Andrews will return direct to New York, arriving about the end of September or the first of October. Mr. Heller will probably spend some time traveling in India, but will no doubt reach New York about the same time.

WAR SERVICE OF CHEMISTS

DR. JULIUS STIEGLITZ, president of the American Chemical Society, and Dr. Charles L. Parsons, secretary, have, under date of July 24, addressed the following letter to the members of the American Chemical Society:

In accordance with the resolutions passed by the society at the Kansas City meeting, the officers of your society have been urging the government that chemists, as in England, Canada and France, be used for chemical service in the war, either in the employ of the military branch, of the other government branches, or of necessary industries. A special committee was organized by your president, consisting of Dr. W. H. Nichols, chairman, Drs. M. T. Bogert, A. A. Noyes, your secretary and your president, to lay definite recommendations before the authorities. These have been published in the July number of the *Journal of Industrial and Engineering Chemistry*.

The government, it appears, has decided that there will be no general exemption of any class of men as a class—for reasons which are eminently wise and necessary at the present moment. At the same time, no doubt, it is anxious to see every man used in what appears to it to be the right place for him. It has seemed perhaps best to make no general ruling whatsoever, except to the effect that there will be no class exemptions, and to leave

the place of meeting was decided at a meeting of Latin-American representatives at the Pan American Union in Washington. All forms of electrical communications will be discussed but radio will be the principal topic, the general purpose of the conference being to bring up to date the regulations adopted at the London radio conference in 1912 and to amend them to fit conditions in the Western Hemisphere.

An international conference for the drawing up of radio regulations for the entire world has been proposed to the Advisory Committee on Communications and Transit of the League of Nations with the request that the council of the league take the necessary preliminary steps. The proposal was made by a committee of radio experts which recently met in Geneva. No official recognition of the proposal has yet been made by the United States.

PIONEER INVENTIONS OF THE CHINESE

Science Service

CHINA produced fundamental discoveries and inventions of greatest value to the human race long before the rise of western civilization, according to a statement made by Chung-Yu Wang, consulting mining engineer of Hankow, China, to the Engineering Foundation of New York. Mr. Wang points out, however, that "Unfortunately for China, and indirectly for the world, the Chinese mind, through centuries of classical education, has failed to make application of its new ideas and to make any progress from the inventions and discoveries of the ancients." The Chinese invented the compass, paper, printing, glass, the seismograph and many alloys, and, in addition, anticipated modern medicine.

Records show that Chow Kung in the Chow Dynasty, about 1122 B. C., used a kind of wagon equipped with an instrument that pointed always toward the north. Paper was first made by Tsai Lun, out of tree fibers, rags and hemp, during the Dynasty of Eastern Han, the early part of the first century. Fung To originated the art of stereotyped wooden plates about the year 932 A. D., but later investigation made by the sinologue Stanislas Julien has shown that the invention actually dated from the year 593. Glass was first manufactured by Pun Fang about the early part of the second century, and he had a piece carved with 130 designs. An instrument, resembling perhaps the present day seismograph, was invented by Chang Heng in the first century, during the Han dynasty, which could record any slight earthquake not perceptible by human senses.

In Tai Hao's time (2852–2737 B. C.) metallic coin was already in circulation. The inventive genius of the ancient Chinese can nowhere be more explicitly shown than in the art of making alloys. An alloy, similar to German silver, under the name of Pait' ong, was obtained by fusing "red steel" with arsenic. The manufacture by the ancient Chinese of gongs and tom toms, with their perfect tones, still remains to us a mystery, although their chemical composition has been determined. Mr. Wang also believes that there is a great deal of Chinese medicine that is both useful and illuminating when viewed in the light of occidental medical science. The Chinese anesthetic, known as Ma Fat powder, a sort of hashish, was discovered by the famous Chinese surgeon, Hwa To who lived in the early part of the second century during the Eastern Han dynasty. An old Chinese text tells us that Hwa To administered the medicine to his patients to render them unconscious before being operated upon. This happened long before ether or chloroform was discovered in Europe.

Recently two experimenters at the Rockefeller Institute for Medical Research, in New York City, obtained a white secretion, which they have named Bufin, by stimulating the parotid gland of the toad by means of electricity. Its physiological action is almost similar to that of digitalis. This is merely a rediscovery of a medicine long known in China. The identical white secretion is obtained by the Chinese by touching the biggest wart-like swelling just behind the eye of a toad with a hot iron. The secretions thus obtained from many toads are allowed to evaporate slowly to a powder, which is now mainly used as a heart remedy.

ARTIFICIAL MANURE

Science Service

ARTIFICIAL "farmyard" manure made without the
of animals is the achievement of English scientists
Rothamsted Experimental Station. Chemical
have been worked out whereby various plant pro
be converted into a manure quite comparable
yard manure, and the process is being appli
cess on a commercial scale in various parts
The new fertilizer is expected to aid th
conquest of the farm.

Plodding scientific research led up
From 1913 to 1915, E. Hannaford
chemist, investigated the losses w
preparation and storage of farm
found to be very great. Mr.
avoidance of part of these lo
to be possible, as merely m
To use his own words: "
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timber types for observation and study. The virgin stands of some of the other distinctive forest types have already been cut away and have thus become lost to plant science and future generations.

IN the article entitled "A Concept of the Ultramicroscopic Virus Diseases and a Classification" by Professor Earl B. McKinley, printed in the issue of SCIENCE for November 18, the words "the filtrability of" were omitted from the heading near the top of page 453. It should read: "IV. Virus Diseases with no Cell Inclusions Which are Transmissible and the Filtrability of the Causative Agent has been Definitely Established."

DISCUSSION

EXPLORATIONS IN CHINA

THE Commission for the Preservation of Antiquities read with great surprise the recently published statement, evidently given out by Dr. Roy Chapman Andrews, in which he seemed purposely to mix up a matter of purely scientific interest with the present political situation. In 1928, the commission did voice Chinese public opinion in objecting to Dr. Andrews' expedition, which freely made extensive excavations of paleontological and archeological objects from Chinese territory under the cover of a simple hunting passport. But the commission never ceased to assure the American Museum of Natural History of its friendly attitude toward scientific cooperation, and, in fact, the commission itself in March, 1930, entered into an agreement with Dr. Andrews for a Sino-American cooperative expedition into Inner Mongolia, which was carried to a successful completion. The agreement, while giving full consideration to the scientific interest of the expedition, tried to provide for necessary safeguards of Chinese interest and participation in this important scientific enterprise. But in view of the interest of the American Museum of Natural History in having representative specimens kept in New York, the agreement was so worded as to make possible the transport of the bulk of the collection to America for scientific study, requiring the return to China only of representative duplicates of the fossils and two casts of those specimens without duplicates, so that there will be in China a complete representation of the whole fauna collected. With this agreement approved by the Chinese Government, the bulk of the collections was allowed to be exported to America for scientific study.

It was, however, voluntarily and repeatedly declared by Dr. Andrews, in 1930, that that expedition was to be the last one of a series which he had carried out since 1922. The commission was thus surprised to receive in the spring of 1931 a letter from Dr. Andrews asking for permission for another expedition without any interview with any representative of the commission. Dr. Andrews shortly returned to America and repeatedly attacked the Chinese Government with unfriendly articles in the American press. Not a word has been received by the commission from Dr. Andrews this time, and the commission has had no knowledge whatsoever of his recent coming to Peiping until his last published statement. Thus the friendly cooperation between the American Museum of Natural History with Chinese scientific institutions has been made difficult, solely because of the unfriendly attitude of its representative, Dr. Andrews himself. The commission anticipates that the American Museum will itself deplore, as does the commission, the recent statement of Dr. Andrews, which is so contrary to the position of justice and friendship taken by the American Government and public in the present unfortunate situation. We are confident that the great American institution does not really intend to use any political weapon to intimidate the Chinese Government, in order to obtain an authorization for scientific cooperation, which this commission is always ready to promote, whenever proposed, on a fair and reasonable basis. With such understanding, the commission again declares itself ready to consider or submit to the proper higher authority or refer to the proper Chinese scientific institution any proposal of Sino-American cooperation for scientific expeditions despite any possible existing personal misunderstanding, and expresses its regret that Dr. Andrews sees fit to make such a declaration, which would make the real attitude of the American Museum misunderstood by the Chinese people.

CHANG CHI, *Chairman*
National Committee for the
Preservation of Antiquities

THE above statement was sent to the president of the American Museum of Natural History on September 24 with the following letter signed by Mr. Chang Chi:

I have the honor to enclose copy of a statement recently issued by this Commission regarding the interruption of the Central Asiatic Expedition which I regard as a most unfortunate breach in the cultural relations between China and the United States. The position of this Commission is clearly defined in that statement. Although I have not had any personal part in the negotiations, I have always fol-

lowed the reports with interest, and regret most deeply that they should have been brought to a close largely by what appears to me to be personal reasons.

That this view is shared by most foreigners in China is clear from the editorial appearing in the American owned and edited *China Weekly Review* of September 10, copy of which is herewith enclosed. While I do not wish it to be thought that we endorse all the opinions expressed in that editorial, and I want particularly to dissociate myself from certain irrelevant statements about Dr. Andrews, it nevertheless serves to call attention to certain difficulties which confronted my associates but which they have not deemed necessary to place too much emphasis before.

I repeat from our statement that this Commission is always ready to promote scientific cooperation, if proposed on a fair and reasonable basis; but that it cannot accept responsibility for failures due to unfriendly attitude exhibited by other parties.

To this letter Dr. Henry Fairfield Osborn, president of the American Museum of Natural History, replied on November 14 as follows:

I have your letter of September 24th, regarding the closing of the Central Asiatic Expedition work in China. I agree with you that it is a most unfortunate breach in the cultural relations between your country and the United States.

The American Museum of Natural History entered upon its investigations in 1921 with a full understanding with the Geological Survey of China. It was agreed that we would confine our explorations to regions where the Geological Survey could not work. These districts were clearly specified by Dr. V. K. Ting, then director of the survey. In return, the survey agreed that we could work unhampered in Mongolia. We have satisfactorily carried out our part of the bargain. The Geological Survey, at that time representing the scientific men of North China, has not adhered to its part of the agreement.

Until 1928 the expedition had the most cordial relations with Chinese scientific men. In that year, when the Central Asiatic Expedition returned from Mongolia, its collections were detained at Kalgan without any legal or moral right for six weeks by order of the unofficial body known as the "Cultural Society." The American Museum was astonished at such treatment and naturally highly disturbed. It was charged by the Cultural Society that the expedition went into the field with only "hunting permits." That year the expedition had the same permits that it had had in all preceding years. The Cultural Society, the Geological Survey and the entire world knew exactly upon what work the expedition was engaged.

In 1929, the expedition was not allowed to proceed into the field because of demands made by your commission which we consider were exorbitant and without international precedent.

In 1931, Dr. Andrews came to Peking, at my request, to negotiate with your commission for further work in Mongolia, which had been made necessary by the discoveries of the 1930 expedition. To our great surprise, he was not even accorded the courtesy of an interview by your commission. Such treatment of the official representative of the American Museum can not be lightly passed over.

After mature deliberation, I decided in conference with the scientific staff that it was useless for the American Museum of Natural History to expend more time and money, trying to carry on scientific work under such obstructive conditions. It was unanimously agreed that the Museum should enter into negotiations with the new government of Manchukuo. It was hoped that a more liberal attitude toward international scientific work would be found among the authorities of the new state. Happily, such was the case, and Dr. Andrews was instructed to close permanently the museum headquarters in Peking and return to America until such time as we wish to resume work from the new base.

In the statement of the commission, which you enclosed, you intimate that Dr. Andrews was not empowered to take this action and that the American Museum of Natural History will deplore such a position. In reply, I may say that Dr. Andrews is vice-director, in charge of exploration and research, of the American Museum of Natural History, and has at all times officially represented the American Museum in China. His action was taken upon my instructions.

In regard to the editorial from the *China Weekly Review*, a copy of which you enclose, I must say that it is quite at variance with other editorials from foreign language publications which have been brought to my attention. I would suggest that you refer to the editorials in *Le Journal de Pekin, The Shanghai Times, The Shanghai Evening Post and Mercury, The China Press, The North China Star, The P. & T. Times* and *The China Journal*. It is my opinion, derived from these editorials and from many other sources, that the statement in *China Weekly Review* is by no means a true expression of the opinion existing among foreign residents of China.

The American Museum regrets as much as does your commission that the friendly relations which existed between Chinese scientific men and the American Museum of Natural History until 1928 should be thus severed. Such a condition is most unfortunate from every standpoint. I feel, however, that it has been brought about through no fault of ours. Dr. Andrews insisted upon the privilege of completing our work in Mongolia, which was entered into in 1921 under a definite agreement with the Geological Survey. Apparently this has made him unwelcome to your commission. I can not, however, agree that there was any other course open to him.

You state that your commission "is always ready to promote scientific cooperation if proposed upon a fair and reasonable basis." I feel that the proposals made to you by Dr. Andrews were both fair and reasonable. It is difficult to see how it would be profitable for this museum to conduct field work under any other conditions.

EARTH ROTATION AND RIVER EROSION

UNDER the above title SCIENCE for November 11 contains an interesting article by Professor Herman L. Fairchild. After pointing out the minuteness of the deflective force which arises from rotation of the earth, Professor Fairchild gives briefly the results of an examination of topographic maps for the state of

leavened with energy until national policies present a healthy and vigorous character.

The growth of the West has hitherto been based chiefly upon mining, agriculture, and stock-raising. The output of minerals was never greater than it is now, nor were prospects ever surer that it will increase. New ore deposits are discovered every week, old mines are reopened and worked at a profit by improved processes, large bodies of low-grade ore are now successfully treated for like reasons, and no mining State is assured of perpetual supremacy in production. Montana once rested secure upon her reputation as a producer of copper; now Arizona promises to develop even greater marvels as an ore-bed.

The agricultural product of the West is half the product of the whole country, and the East looks to it to supply the food deficiencies of a future time when denser population will demand the products from a greater area. Even now the West supplies the great surplus of foodstuffs which enter into foreign trade and constitute the bulk of American exports. Colorado leads in the production of minerals, yet her farms now produce an even greater total of values than her mines. Twenty years ago, irrigation was inconsiderable; today, 8,000,000 acres of land are supplied with water.

The stock-growing of the West of twenty years ago is becoming the stock-farming of the more closely settled country. The eastern States have more live stock to the square mile than the States of the West. The West is giving up the range industry for the more profitable and more scientific stock-farm.

Thus the balances measuring the power of the East and the West are slowly but surely reaching an equilibrium. They are practically equal politically. It will not be long before they approach equality industrially and commercially as well. This will come before the population of these two sections becomes equal; for the West has a greater per capita natural wealth, and the East a greater conservatism.

World's Work - Sept. 1904.

INTO MYSTERIOUS TIBET

THE PURPOSE OF COLONEL YOUNGHUSBAND'S BRITISH EXPEDITION; THE CLOSED COUNTRY, THE FORBIDDEN CITY, AND THE PERSONALITY OF THE INVADER

BY

CHALMERS ROBERTS

FOR more than a century the relations between the British Government in India and Tibet have been more or less unsatisfactory. There was an encounter in 1888 between the Tibetans and the Sikkimese, because the Tibetans had invaded Sikkim, and British troops had to go and drive the invaders out. After this a treaty about Tibet was concluded with Pekin, but it has practically remained a dead letter. An attempt was made in 1893 to inforce its provisions, but the regulations drawn up in that year have likewise been evaded. Finally, recent reports of Russian intrigue reached the Indian Government (it is even said that the Russians secured the entrance of a representative to Lhasa) and caused Lord Curzon to make an attempt to deal directly with Tibet by sending a peaceful mission. At least, it was peaceful until there was hostile opposition.

This is, in outline, the purpose of the expedition. In the great globe-circling game of land-grabbing, Tibet is a buffer-state of immense importance to India, whatever power finally gains predominance in China. Of course, the negotiations preceding the starting of the mission were studiously correct. Lord Curzon, in sending a complaint to the Tibetans, demanded the appointment of a joint commission for the purpose of discussing and deciding the two main issues in the neglected treaty—trade and boundaries. To this, the Lhasa authorities assented readily enough, but, for three months, the English commissioners cooled their heels at

the meeting-place before it was decided that the mission was "peacefully" to advance. It does not seem that the Tibetan commissioners ever intended to meet the English. From an Oriental point of view, this is by no means a breach of faith, but rather a creditable ruse. It places the English in a false and humiliating position, commits Tibet to nothing, and enables her to make preparations for defense in case her inactivity is resented. It is of such obvious disadvantage to India that Tibet should ever be opened up to the outside world, that Lord Curzon's protestations against annexation are sincere. The more tightly shut up the whole northern boundary of India is, the better for English supremacy in the South. The space between India and Tibet lies between two adjoining countries, which remain sealed so far as outside influence is concerned—Nepaul and Bhutan. Both these lie nominally within the British sphere of influence, but, save for the capital of Nepaul, Khatmandu, they are as unknown and as impenetrable as Tibet itself. What Lord Curzon wishes to secure is freedom from foreign influence in Tibet. As has been said in a recent British Blue Book published on the subject: "Any attempt to annex the wild and inhospitable upland kingdom would be the act of a madman. If the result of the present expedition be to turn the key in every gate to Tibet with a double turn, the utmost hopes of the Indian Government will be accomplished.

So much for the dry details of treaties and blue books. It is in the character of the country invaded, in the personality of the man who leads the mission, that the fascination of the thing lies. No white man living has ever seen Lhasa and returned to tell of it. This alone lends enormous interest to the expedition. Tibet is perhaps the last land of mystery remaining in the world. Certainly, every other land with as strong a claim to civilization has long since been explored, but this one great semi-savage land, guarded by the highest mountains in the world, remains the last place from which the innovating white man is fiercely excluded. Here one woman may have many husbands, but a man may have only one wife, many brothers often sharing the privilege of husbandship to the same woman; the ruler of the land is forever a child, for every ruler dies before he comes of age; the inhabitants wash themselves with grease, and praying is done by machinery. Within the walls of Lhasa itself, the great mystery where the Grand Lama dreams away his sacred but brief existence, only three white men are known to have set foot. In 1811, an Englishman named Manning entered, disguised as a lama or priest. In 1846, two French priests did the same thing; but, since then, no returning traveler has penetrated the stronghold. This alone is enough to make every youth in England long to hear the story which the present mission will tell, if it continue its march; to make even older men hope that it may push on regardless of opposition. So much for the glamour of sensation and romance with which this particular movement of red-coats is surrounded. Lhasa lies, as the crow flies, within 200 miles of the Indian boundary, and Colonel Younghusband may have reached it by the time this article is printed.

Tibet has an absolutely religious government, or theocracy, the head of which is supposed to be the Grand Dalai-Lama, looked upon as the reincarnation of Buddha, although the real ruler is a temporal chief called the Gyalpo. The Grand Lama is usually chosen at the age of five or six. He is kept in the palace at Lhasa, and is never seen by the outside world. The Gyalpo, or regent, has charge of the Lama, and, at the age of fifteen or sixteen, the Lama dies of some mysterious disease. It is then announced that his spirit has passed to another infant, who will be found at a certain place in a certain family. The child is always found as directed, and duly installed with great pomp and many weird ceremonies.

In Tibet, the many-husbanded ladies delight in decking themselves with the great matrix turquoises which we now see also on this side of the world, and they wear many so large as to be worth fortunes.

The prayer-wheel of the Tibetan, of which so much has been heard, is like a barrel with prayers written around it. The person who wishes to pray gives the wheel a turn on its axle, and the prayers are supposed to be said for him as long as the wheel continues to turn. What an opportunity for the praying man to go on with some other occupation! It would not take the inventive Yankee Buddhist long to arrange a mechanism by which his entrance into Nirvana, said to be accelerated by prayer, would be pushed rapidly forward. Think of having a number of mechanically worked prayer-wheels going at once, and knowing that your spiritual progress was advancing over a period which would otherwise occupy millions of years of incarnations.

The Holy City itself has been often described, and even now English artists are drawing imaginary pictures of it for illustrated papers, deterred by no such small thing as lack of a sketch to work upon. The well-known young Asiatic traveler, Mr. Perceval Landon, putting together the several accounts that have reached the outside world, describes it as a comparatively small town, of about twenty thousand inhabitants, sheltered from the inclement winds of central Asia by a huge ring of mountains which have to be climbed before it can be sighted from any side. In the centre of this valley, which may be four miles across, lies the city—a pretty collection of gardens and low ochre-roofed houses, with water flowing openly through the streets. But the eye of the traveler would surely leap quickly over the mean houses encircling it, to the great rock which rises abruptly from among them. For there before him would lie at last the shrine which has been the object of so many ambitions. It is a saddle-back formation, sheer on three sides and steep on the fourth, four or five hundred feet in length, and covered from end to end with the sacred buildings of this holy of holies. From either side, a well-paved roadway zigzags up from the city, and, on the left, there is a flat-terraced and guarded space, reserved for religious ceremonies. All the masonry on either side is white. Only in the middle, like a great saddle of crimson on a saddle-cloth of white, rises the dull-red Palace of the Grand Lama. Tier after tier of windows, red or white, reach almost from the ground to the roof. Beneath the palace, just where the northern zigzag sweeps up from the plain of the city, stands the famous Pillar of Lhasa. This is the objective point of all Buddhist pilgrims of the north. In fact, it is to them what the black stone in the wall at Mecca is for the Mahommedans, the goal and shrine of all that their religion means to millions of the devout. Such is the description gathered from all available sources. It may be that, in ten years, it will be less difficult to reach Lhasa than the Klondyke. There is something pitiful in the small and ignorant resistance to investigation and discovery on the part of the people of this lonely mountain kingdom of holy men.

When the British expedition reached Gyangste, it put itself on terms of perfect amity with the surrounding Tibetan population. The camp was turned into a market, and the people came fearlessly within the lines, offering for sale vegetables, tobacco, and trinkets, delighted to find such customers in the strangers, who had dared to molest the ancient solitary reign of the Dalai-Lama. The British soldier never finds much difficulty, in his homely way, in making friends with native populations. He pays cash, and would much rather be on friendly terms with hermit populations than shoot them down, even in self-defense.

At Guru, for the first time, perhaps, these savage warriors met a foe who bound up their wounds along with his own, and set free prisoners unharmed. We hear, too, of an abbot coming at one place to see Colonel Younghusband in order to apologise for the conduct of his monks in joining a recent attack upon the British. They had no business to fight at all, he said, but they had been egged on to do so from Lhasa. He had admonished them as a superior should; he had had them beaten! Not for a long time has there been anything more comical in the history of war and diplomacy. The monks of a Tibetan monastery are soldiers, somewhat like the old-time Knights Templar, and, like them, no doubt they prefer fighting to praying. There is only the abbot's word for the second whipping which his holy knights received, and Colonel Younghusband is too good an Orientalist to believe all he is told. But he was so pleased with the abbot that he remitted the fine of grain imposed upon his monastery and allowed the old man to go back happy to his praying-wheel. What will next happen in such a country, no one can foresee. There came news later from the long-delaying Chinese Amban that he was on his way, as he had been for six months, and that the Dalai-Lama, at last rising to the necessity of the occasion, had provided him with a transport befitting his rank. Certainly, in the end, the Dalai-Lama, or those who act for him, will go to any extreme to keep the expedition away from Lhasa itself. It is

equally certain that the expedition will reach the city—or has reached it.

It is upon the leader of the expedition itself that the chief interest centres. And it would be a personal gratification, no doubt, to Colonel Younghusband himself to go there—the end of many years of long and hard travel roundabout. He is an authority on the country. Since his boyhood he has been taking journeys across Asia, and writing books to tell about them, until, with his brother, he fills a long page in the catalogue of the British Museum. His career is one of romantic adventure, combined with serious work of a kind so often done in the British service, and so infrequently done elsewhere. For, if older Englishmen at home love tales of sport and danger and discovery, young Englishmen abroad know how to supply them. This young man, really a Major, and Colonel only for this mission, has already a wonderful record in books of reference. He is fit product of the marriage of a well-known Indian soldier, now Major-General Younghusband, retired, with a sister of Robert Shaw, the great traveler. It has been, all told, a famous family, for his elder brother is that "Younghusband of the Guides" whose name Kipling has made a household word. In fact, it is not to be wondered that the average journalist mixes up the two brothers, George and Frank, to the utter distraction of the public. They are both great travelers, both write books of travel, and both have gone from honor to honor in the service and out of it.

To paraphrase briefly the Army Record, Major Francis Edward Younghusband was made a Companion of the Order of the Indian Empire (C. I. E.) in 1891, and was given the Kaisar-i-Hind medal for public service in 1901. For his travel across central Asia he was made gold medallist of the Royal Geographical Society, that coronation of the hopes of all young travelers. He joined the First Dragoon Guards in 1883, but was afterward transferred to the Indian Service Corps. He was traveling on leave in Manchuria as early as 1886. He went from Pekin to India by way of Chinese Turkestan in 1887. In 1889–90 and '91, he travelled on the Pamirs in Central Asia, thence to Hunza, where he was made political officer for the Indian Government in 1892. He held the same post at Chitral, a dependency of Kashmir in 1893–94, and went with the Chitral expedition of 1895 as special correspondent of the London *Times*. For the same journal, he visited South Africa in the troubled days before the war in 1896–97. On his return to India, in 1898, he was made political agent for Haroati and Tonk. This seems a very bare record, but it covers a world of interesting activity. Merely the story of that famous march, as a very young man, over "the roof of the world," set all England in a fever of admiration for him. This was when, in 1886, having, in Manchuria, explored and ascended the famous "Ever White Mountain," he went south to Pekin and began his journey to India. With great difficulty and in constant danger, he crossed the Desert of Gobi in Mongolia, China's northern dependency, penetrated Eastern Turkestan to its capital, Kashgar, thence southward to Yarkand, threaded the heart of the western Himalayas, by the Mustagh Pass, 19,000 feet above the level of the sea, and finally reached Srinagar, the capital of the northern Indian State, Kashmir. Of course, such a man would not be neglected by any government, and he has been constantly taken out of the service for political duty in the places enumerated above. It is difficult in these few lines to picture what such traveling means. For instance, without an Alpine apprenticeship in mountain-craft, it must have been no easy thing to drag not only yourself, but a train of ponies heavily laden with stores, over unknown glacier passes at the summit of the Himalayas; and this is what Younghusband has done again and again. For months at a time, he has camped in altitudes of from fifteen to sixteen thousand feet, often without a tent, sleeping in the open. His most famous book, "Through the Heart of a Continent," is now a perfect manual for travelers in Asia. Yet, in it, one will quickly discover that the author does not believe in unnecessary hardship, which he holds almost *tantamount to disaster*. He declares that it is always his principle to make himself as comfortable as circumstances will permit, and to husband all his strength for unforeseen hardships. As a result of this practice, he is today perhaps better acquainted than any man living with the difficult and mysterious country between the Indian Empire and the ever-advancing outposts of Russia.

COLONEL YOUNGHUSBAND AND HIS STAFF

THE CHANGELESS HIMALAYAS
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COLONEL FRANK YOUNGHUSBAND

In Russia, they know him as well, if not better, than his own people do, and they fear him as much as the Russians fear any one. Indeed, once on his travels he was ordered off Russian territory in the Pamirs by an officer, Colonel Yonoff, in such a high-handed way that the Imperial Government at St. Petersburg afterward tendered him a full and official apology. With all this behind him, do you wonder that he goes on his way to Tibet with the keenest will; that Young England knows he will get to Lhasa if there is a possible path? From physical difficulties in the way he has surely nothing to fear, and the Tibetans have no trait or trick of cunning which he has not met again and again, and checkmated. In writing down his views upon the method of dealing with Eastern craft, he says: "If once the European gives up his higher moral standard and descends to intriguing with Asiatics, the chances are very much in favor of his being worsted. On the other hand, where real influence has been gained by a European over Asiatics, it has been due to his straightforwardness and strength of moral character, and not to any original mental superiority."

Mr. A. J. Montefiore Brice lately recalled to the readers of the London *Daily Mail* an interesting incident which had a great influence on the later life of the chief actors concerned. The occasion was a public eve-

A TIBETAN ABBOT OF HIGH INFLUENCE

A COMPANY OF TIBETAN NUNS OUTSIDE THEIR NUNNERY

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THE FIRST CAMP OF THE BRITISH FORCE IN TIBET

A FROZEN WATERFALL ENCOUNTERED BY THE BRITISH FORCE

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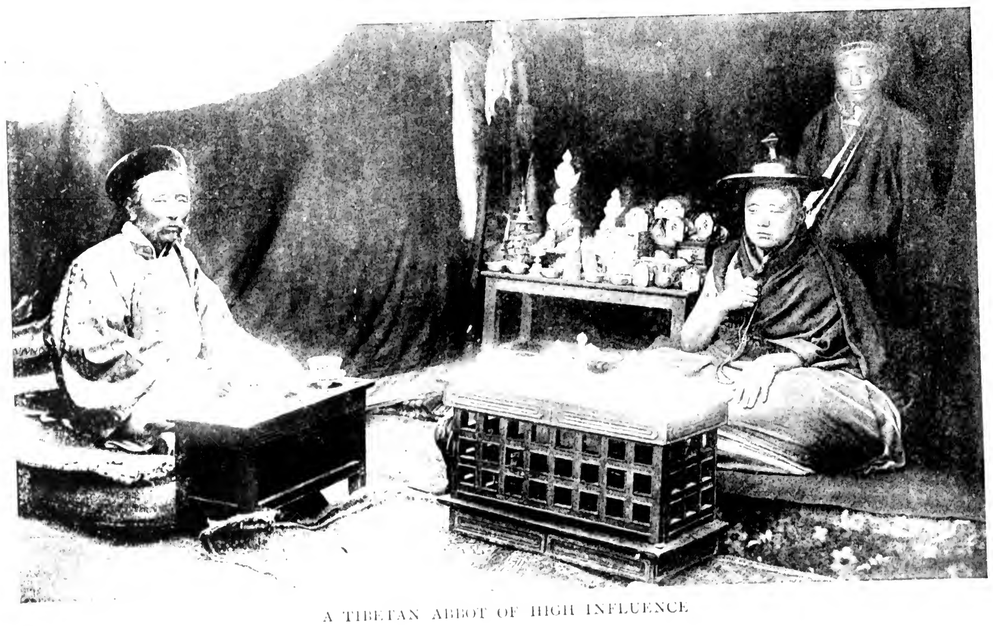

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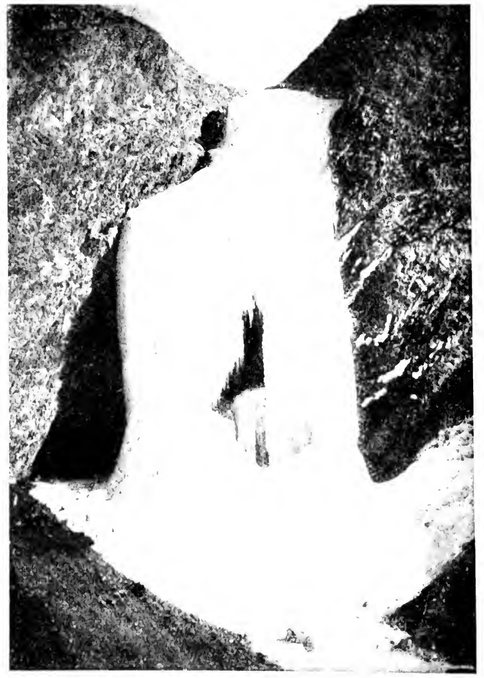

A FROZEN WATERFALL ENCOUNTERED BY THE BRITISH FORCE

the benches in the hall a quiet-looking man, with a singularly soft and pleasant voice. At first there seemed nothing to distinguish him from a hundred other men in the room. He was of middle height, clearly a soldier, though tending to stoutness in his figure and to ease in his carriage; his features were regular, his mustache heavy, his chin strong, and his jaw square—apparently just one more of the many soldiers whom the Geographical Society gathers into its fold. But, as he spoke, he became changed. Deep below his heavy brows his large, clear eyes gleamed with a singular intelligence; and, though his voice was so softly modulated and his manner so simple—so full, perhaps, of the reserve of strength—he proceeded to apply to Lord Curzon's brilliant paper a criticism sharpened and pointed at every turn with personal experience. And it was all the more scathing and severe because it was spoken in a conversational tone, with slow, deprecatory gesture, and so, evidently, without either passion or prejudice.

The speaker was Frank Younghusband, then the hero of his great journey through the heart of the continent of Asia which won for him the society's gold medal and established his reputation for an intrepid daring and resource that comes to few. The pleasant sequel to this memorable evening is that, when Lord Curzon became Viceroy of India, he did not forget his critic. It is an open secret that he was strongly opposed to the withdrawal of Younghusband from Chitral. "Had he remained there," declared the Viceroy subsequently, "I believe the outbreak would never have occurred." As soon as he had the power, he sent Younghusband as agent to Indore, the capital of one of the Central Indian States, and now he has intrusted to him the delicate and difficult task of negotiating with the Tibetans for that commerce and those relations so long denied.

Photographed by A. Fowler

TIBETAN SOLDIERS ARMED WITH FLINT-LOCKS

Colonel Younghusband is by no means merely a man of action. He is also and pre-eminently a man of thought. Beneath the mask of his genial manner, behind the reserve of his quiet voice, there lies an active, eager brain, without a single cobweb or grain of dust upon it. To such a brain he allies an indomitable will, and this he tempers with inexhaustible patience and tact. In him, you have the elements that go to make the ideal administrator in the ancient and changeless East. It is as a political officer, part diplomatist and part administrator, as the man with the iron hand in the velvet glove, that Colonel Younghusband has won his way to eminence in the service of the Indian Empire, and to a firm place in the hearts of the sentimental, adventure-loving people at home.

A FORTIFIED TIBETAN MONASTERY
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A BRITISH OFFICER MEETING A TIBETAN DELEGATION

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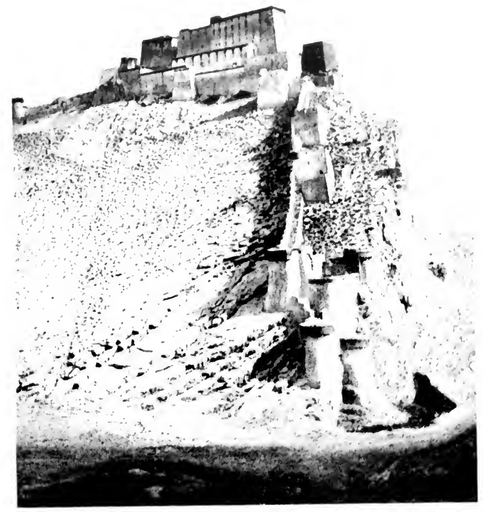

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THE GREAT BUDDHA IN THE HOLY OF HOLIES AT LHASA

The turquoise in the idol's crown is the largest in the world

World's Work, March 1905.

INTO TIBET WITH YOUNGHUSBAND

WHAT THE ENGLISH FOUND IN THE FORBIDDEN CITY BEYOND THE HIMALAYAS—THE GREAT TEMPLE OF BUDDHISM AND ITS MAMMOTH IDOL—THE WONDERS OF THE CITY OF THE DALAI LAMA

BY

PERCEVAL LANDON

CORRESPONDENT OF THE LONDON "TIMES"

As the correspondent of the London *Times*, Mr. Landon accompanied Colonel Younghusband's Mission sent by the British Government in India to Lhasa. This article is a condensed narrative of his experiences, the full story of which is contained in his forthcoming volume, which is the first authoritative description of this wonderful country. The expedition lifted the veil from Tibet. It has again been dropped. It may not be raised again in our generation.

IN Tibet there is only one route from one place to another, and this seriously limits the possibilities of traveling without attracting observation. Thanks to the extraordinary system of Chinese postal relays, it is impossible for a traveler to prevent the news of his arrival. Upon horrible penalties, the Tibetans must report any stranger. Thus, every passer-by along the high road is subjected to a scrutiny which has easily prevented the success of all attempts by strangers to visit the Forbidden City.

The American Government on three occasions sent a request to the Chinese that Mr. W. W. Rockhill be permitted to go to Lhasa. China sent the demands to the Dalai Lama, the head of the Tibetan hierarchy, who refused to grant them. The main responsibility, therefore, for the exclusion of foreigners from Tibet lies with the hierarchy. The Chinese said that they were willing to allow strangers to travel freely in Tibet, but they could not coerce the Lhasa Government. The Lhasa Government declared that they would be glad to see foreigners, but, unfortunately, the orders of the Chinese were imperative. Lat-

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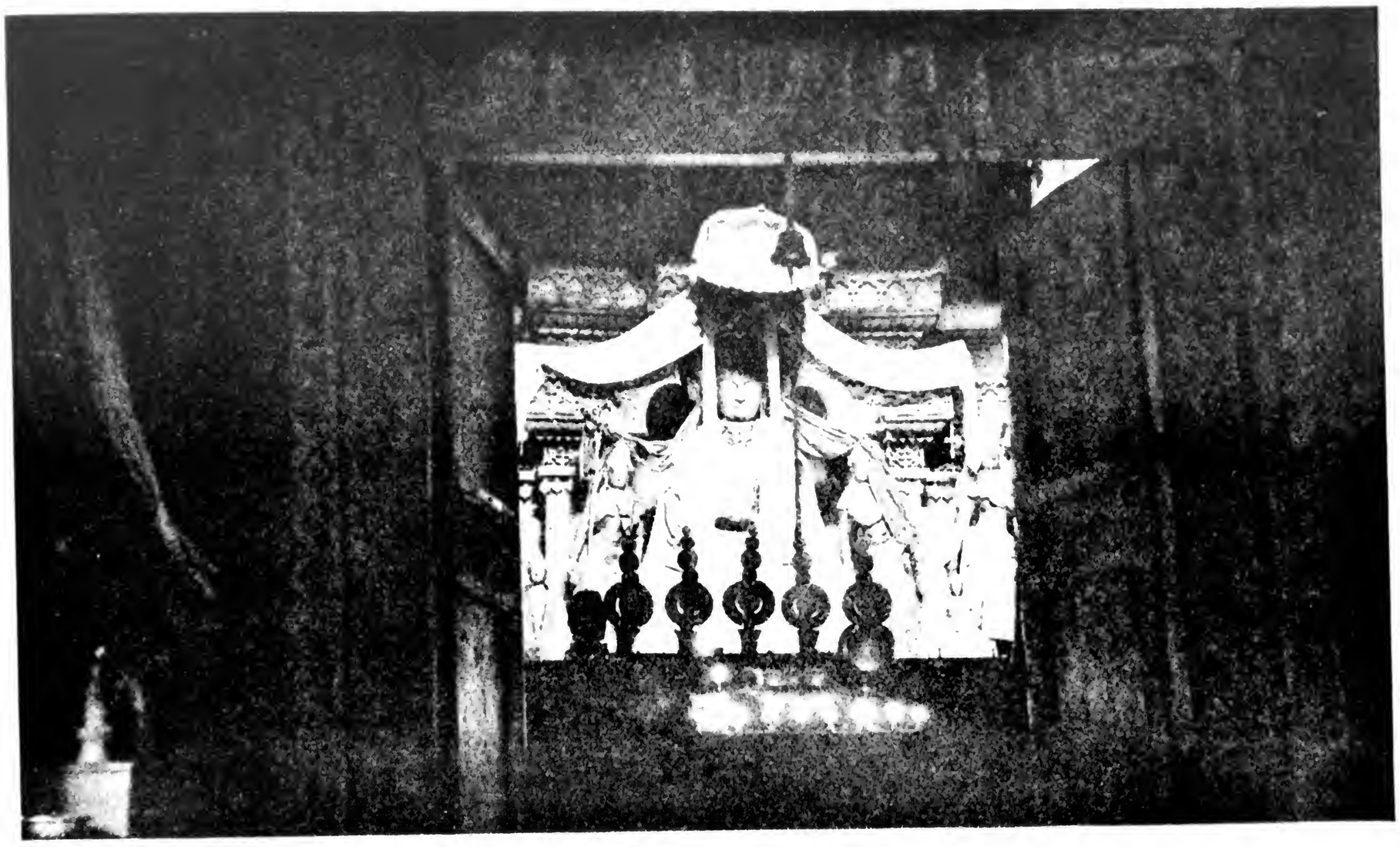
The turquois in the diadem crowns the "urgyen" symbol



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THE POTALA, THE HOME OF THE GRAND LAMA
One of the wonders of the world

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WHY THE EXPEDITION WAS SENT

Had the Tibetans confined themselves to this assertion of their inviolability, the English

THE ORACLE HOUSE AT LHASA

ONE OF THE STRANGELY FORMED BUDDHIST TEMPLES

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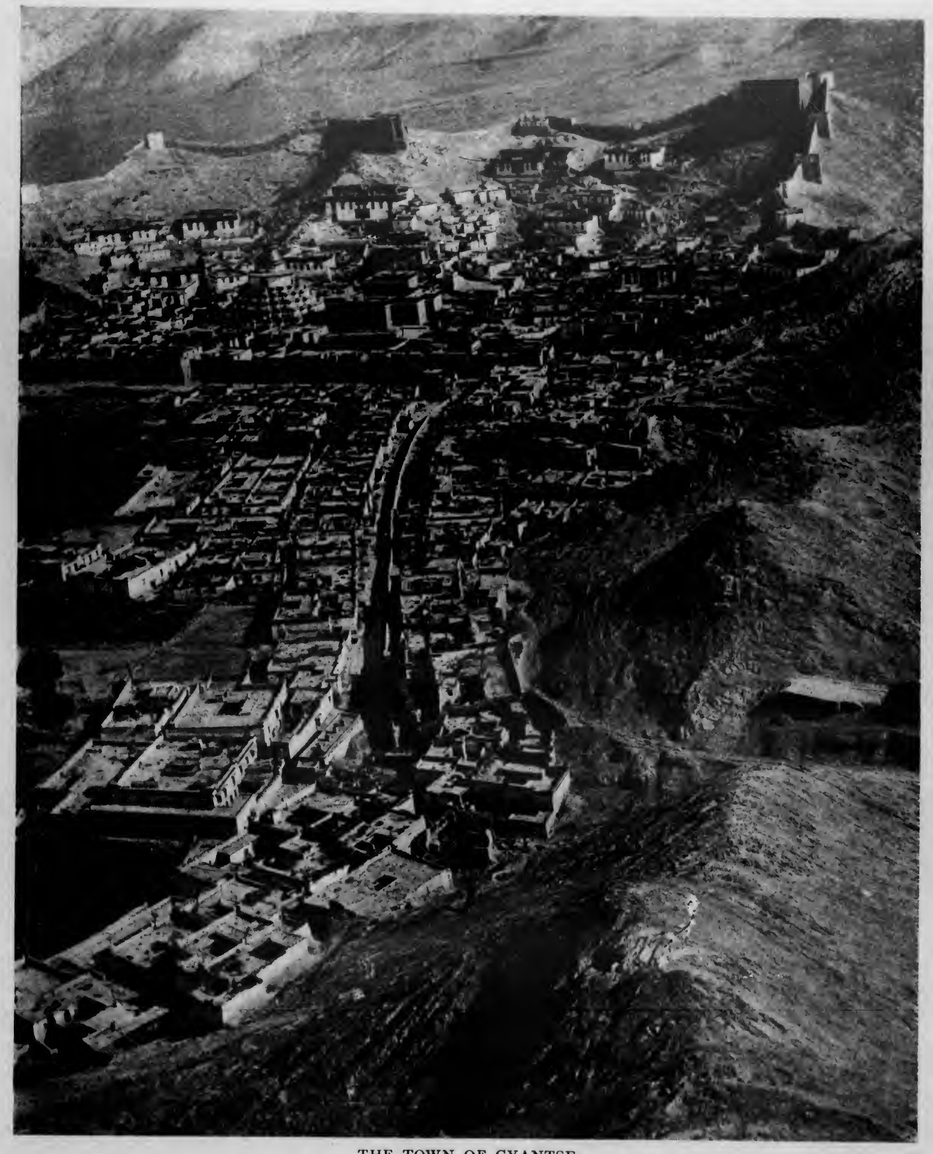
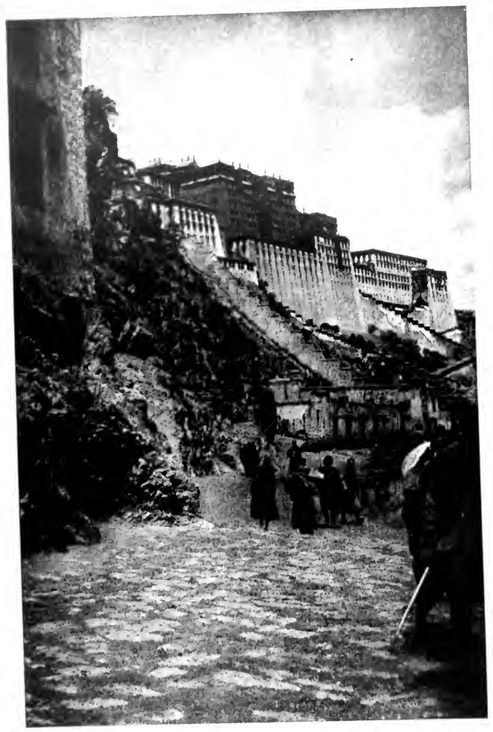
A ROAD IN THE HIMALAYAS



THE TOWN OF GYANTSE
Here the mission made a long halt. It did not advance until the military escort, after a fierce battle with the Tibetans, captured the stronghold

This man went to Lhasa twenty-five years ago —a young Lama from the Siberian Steppes, on the east side of Lake Baikal. He was by birth a Mongolian, but by nationality a Russian subject. He ultimately became professor of metaphysics in the Debung Monastery, in Lhasa. In 1898, he went to Russia to collect contributions for his monastery. When he returned to Tibet, this Ghomang Lobzanz, or Dorjieff, as he is known in Russia, became the Russian agent in Lhasa. He lost no time in trying to persuade the Lhasa hierarchy that it was to their interest to secure the Czar's informal protection. Impetuously, without consulting his National Council, the Dalai Lama accepted the suggestion.



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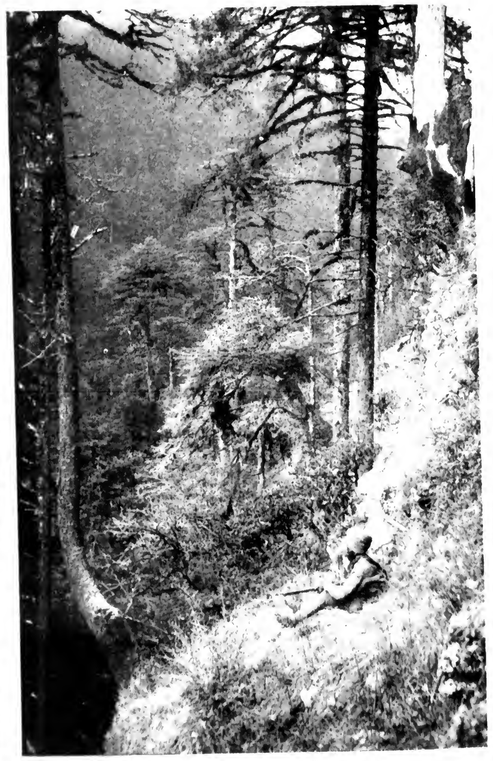

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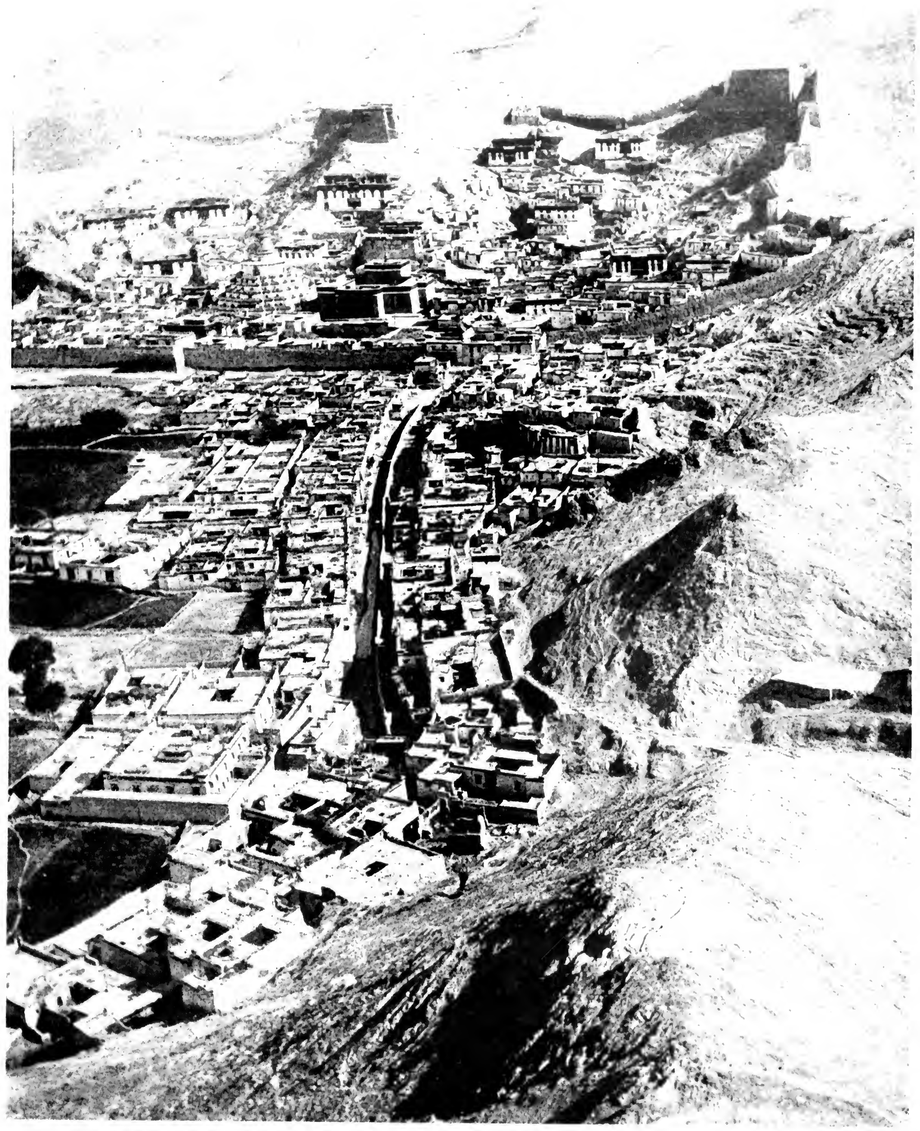

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Database of Preceding Frame

Dorjieff, after one visit to Russia, returned to Lhasa about December, 1901, and laid before the Dalai Lama a proposal from the Russian Government that a Russian prince should take up his residence in Lhasa to promote friendly relations between the two countries. He also brought a treaty. Under the existing relations between Tibet and China no such treaty could have been valid, even if it could have been made. But it was there as an assurance to encourage the Tibetans, should any difficulty arise with her southern neighbors. In return, the Russians asked for facilities which the poor people of Lhasa may be pardoned for having misunderstood. Russian rifles came into the country in camel-loads. The arsenal at Lhasa was burnished up. Dorjieff said that the Russians would have a detachment of Cossacks in Lhasa by the spring of 1903. He seems to have taken pains that this boast should reach Lord Curzon, the Viceroy of India. The fat was in the fire.

THE AMBAN, THE CHINESE REPRESENTATIVE IN LHASA, COMING TO CONFER WITH COL. YOUNGHUSBAND

The excuses for interference were ready. The Tibetans had encroached upon our territory in Sikkim. They had established customs posts at the town of Giau-gong, fifteen miles inside the frontier, and had forbidden British subjects to pass their outposts there. They had thrown down boundary pillars. They had insulted treaty rights by building a wall across the only road of the market town of Yatung, which was thrown open to trade with India by the conventions of 1890–93. They had returned, unopened, letters sent by the Viceroy to the Grand Lama in Lhasa. These insults might never have given rise to the dispatch of an expedition if the Tibetans had not dallied with Russia. As it was, there was nothing else to do but to intervene speedily.

MEETING THE TIBETANS

The utmost that Lord Curzon could persuade the British Government to do was to sanction the dispatch of Colonel Younghusband, with a small escort, to await the Tibetan representatives in the little post of Khambajong, some fifteen miles north of the true Sikkim frontier. Emissaries came down from Lhasa, but, after a formal visit to Colonel Younghusband, they would have nothing further to do with the Mission.

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It soon became evident that nothing could be done in Khamba-jong. It was then arranged with the Indian Government that Colonel Younghusband should go to the town of Gyantse, and there make a second attempt to carry through the negotiations. The behavior of the Tibetans now became more threatening. Representatives of the Three Monasteries forbade the people along the road to supply us with the necessaries of life. Colonel Younghusband summed the position up tersely—"We have not one ounce of prestige on this frontier." Colonel Younghusband, from political motives, determined to winter in the village of Tuna, where three months of weary waiting ensued.

JUST BEFORE THE FIGHT AT THE WALL

The Gurkha scouts deployed on the hillside; the Sikhs beginning to disarm the Tibetans at the farther end of the wall

CROSSING THE HIMALAYAS

The Natula route was decided on as the road by which to bring the supplies over from Sikkim into the Chumbi Valley in Tibet after the alternative road over the Yak-la Pass had been tried. The Yak-la is the shortest road, and, to my best belief, only one party ever crossed it, and it was my fortune to be one of them. The eastern descent is a mere perpendicular scramble four miles deep, down which one could go only by jumping from one boulder to another. Many of these were coated with ice, and some crashed down upon the slightest pressure. I do not think I have ever been so cold in my life. There was a wind like a knife-edge, against which thick clothing was as gauze. The sun blazed down, but this vivid cold searched through everything. The pass itself was nothing but elemental rock, and the Indian file of men dropped down again as quickly as it could into the still cold of the sheltered side of the pass. It was under these conditions that more than 40,000 pounds' weight of stores was daily delivered at Chumbi.

A FEW MINUTES LATER

The British force still firing at the retreating Tibetans

Before the coming of this Mission no white man had ever before seen the Chumbi Valley. We found the people strange. Neither here nor elsewhere in Tibet do the men grow mustaches or beards. The utmost that one ever sees is a thin fringe or a scanty mark on the

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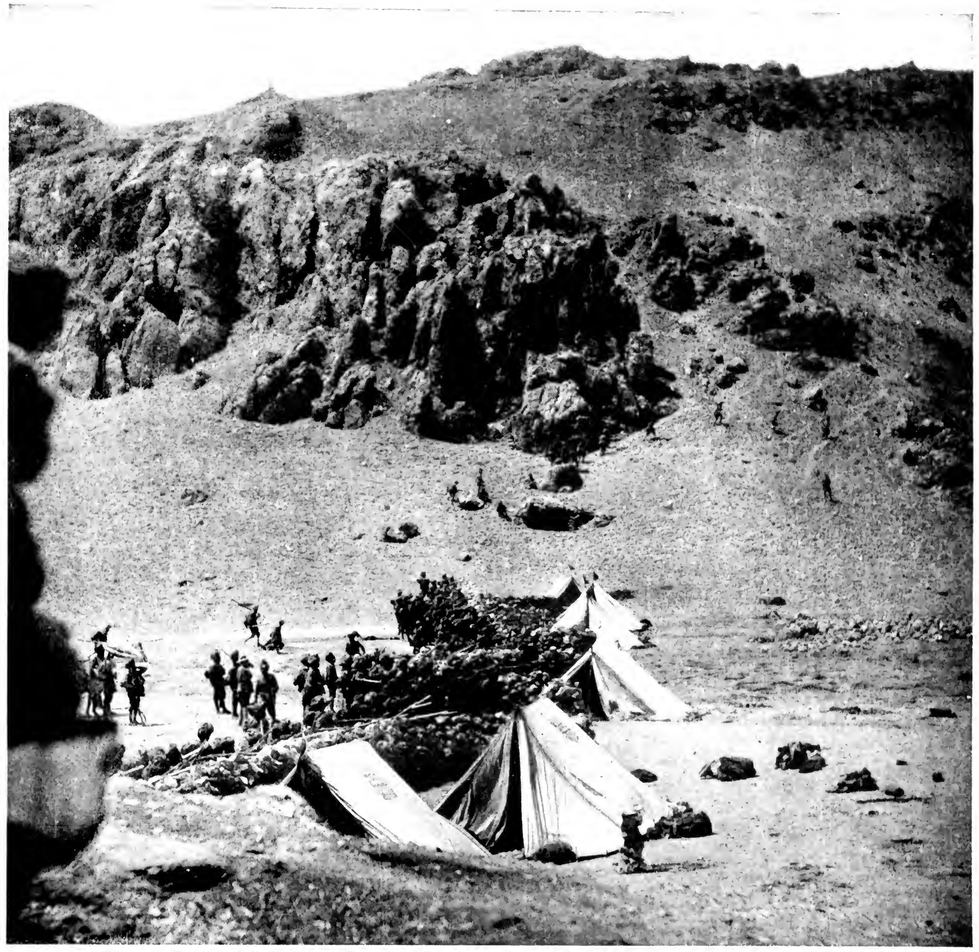

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THE FIGHT AT THE WALL

When at last we made a start for Gyantse, far along the road we came in sight of the Tibetans' defenses. A great space of 3,000 yards of level plain stretched between the end of a poor little wall and the nearest swamp bordering a lake. Just when the wall became clearly visible in the distance, the leading Tibetans rode forward sounding the old parrot cry, "Go back to Yatung." As Colonel Younghusband reminded them, this sort of obstacle had served the Tibetans in good stead for fifteen years. Hitherto it had always succeeded; how, then, were they to realize that the British Government was in earnest? After twenty minutes of exciting discussion the meeting was broken up.

A SACRED ELEPHANT IN THE LUKANG GARDENS IN LHASA

ENCAMPED UNDER THE SHADOW OF THE HIMALAYAS

Acting upon Colonel Younghusband's instructions, Brigadier-General MacDonald, in command of the military escort, ordered that not a shot be fired until the enemy had begun to fire. Out toward the lake, a thin, extended line was pushed forward, far outflanking the wall, and entirely commanding the line of the Tibetans. Meanwhile, the 23d Pioneers and the 8th Gurkhas were slowly climbing the hills on the left. There was a hush of suspense among the civil and military staffs out on the plain, who were watching with strained eyes the slow progress of the khaki dots two miles away. The Commissioner and the General rode in together to the wall, to watch the hundreds of groups of Tibetans massed behind them. When the Sikhs advanced toward the wall and began to disarm the Tibetans, there was difficulty. The chief Tibetan shouted hysterically to his men to resist. As a Sikh advanced to the head of his pony, he drew his pistol and fired, smashing the Sikh's jaw. There was an awful pause, that lasted for perhaps five seconds; then another report broke the stillness. But it was almost unnoticed in the sudden yell with which the Tibetans hurled themselves with drawn swords against the thin line of Pioneers leaning up against the wall.

From three sides at once a withering volley of magazine fire crashed into the crowded masses of Tibetans. Under the appalling punishment they struggled, failed, and ran. It was an awful sight. Men dropped at every yard. At last the slowly moving wretches—and the slowness of their escape was horrible to us—reached the corner of a little spur ahead, where at any rate we knew them safe from the awful lightning storm which they had themselves challenged.

The Mission moved on, following the road between the two lakes, Bam Tso and Kala Tso, where we saw an extraordinary optical illusion. The Kala Tso lake stretched out a great shield of silver gray, and the river, some thirty feet below us, appeared to run up hill into it. Here, for a space of nearly two miles, the hillside road—which clings still to the mountains to avoid the now vanished lake—is marked by a wilderness of great pebbles which have dropped from the walls of houses of a lost civilization. Thousands must have lived there. The scanty, duffle-clad figures who paused with protruding tongues at the entering-in of their hamlets, and the black-aureoled women whose heads appeared inquisitively over the sordid sod parapets of the roofs above, are but a hundredth part of

THE LUKANG GARDEN

A spot in Lhasa which reminded the Englishmen of home

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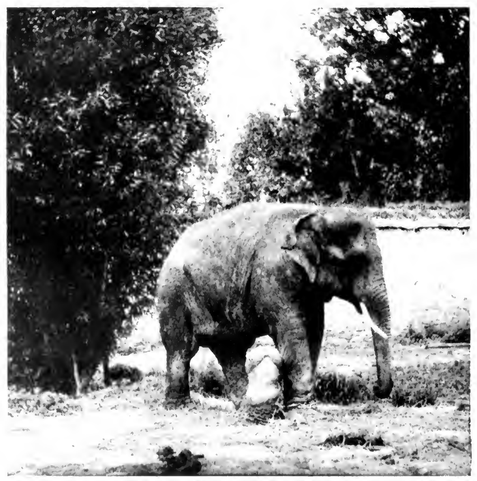

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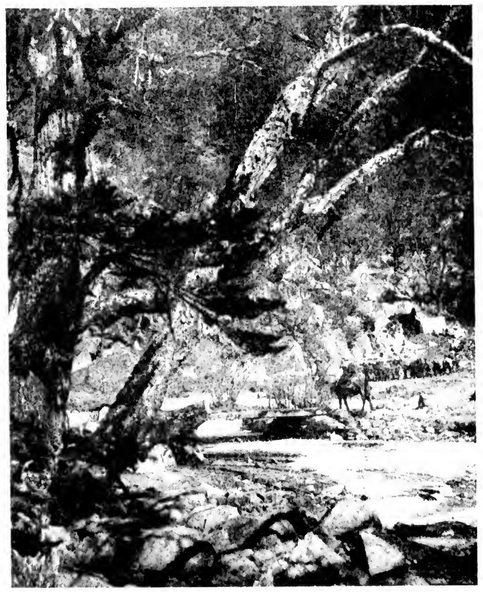

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the Tibetans, there was difficulty. The chief Tibetan shouted hysterically to his men to resist. As a Sikh advanced to the head of his pony, he drew his pistol and fired, smashing the Sikh's jaw. There was an awful pause, that lasted for perhaps five seconds; then another report broke the stillness. But it was almost unnoticed in the sudden yell with which the Tibetans hurled themselves

THE LUKANG GARDEN

A spot in Lhasa which reminded the Englishmen of home

with drawn swords against the thin line of Pioneers leaning up against the wall.

From three sides at once a withering volley of magazine fire crashed into the crowded masses of Tibetans. Under the appalling punishment they struggled, failed, and ran. It was an awful sight. Men dropped at every yard. At last the slowly moving wretches — and the slowness of their escape was horrible to us — reached the corner of a little spur ahead, where at any rate we knew them safe from the awful lightning storm which they had themselves challenged.

The Mission moved on, following the road between the two lakes, Bam Tso and Kala Tso, where we saw an extraordinary optical illusion. The Kala Tso lake stretched out a great shield of silver gray, and the river, some thirty feet below us, appeared to run up hill into it. Here, for a space of nearly two miles, the hillside road — which clings still to the mountains to avoid the now vanished lake — is marked by a wilderness of great pebbles which have dropped from the walls of houses of a lost civilization. Thousands must have lived there. The scanty, duffle-clad figures who paused with protruding tongues at the entering-in of their hamlets, and the black-aureoled women whose heads appeared inquisitively over the sordid sod parapets of the roofs above, are but a hundredth part of

THE WOODS AND MEADOWS SURROUNDING LHASA

the population of a scattered but important trade centre of the past.

At Gyantse, negotiations of any kind were obviously not intended by the Tibetans, but the Mission was obliged to wait here for orders from England before starting for Lhasa. Everything was beautiful in the town. Gardeners were called in, and the yards in front

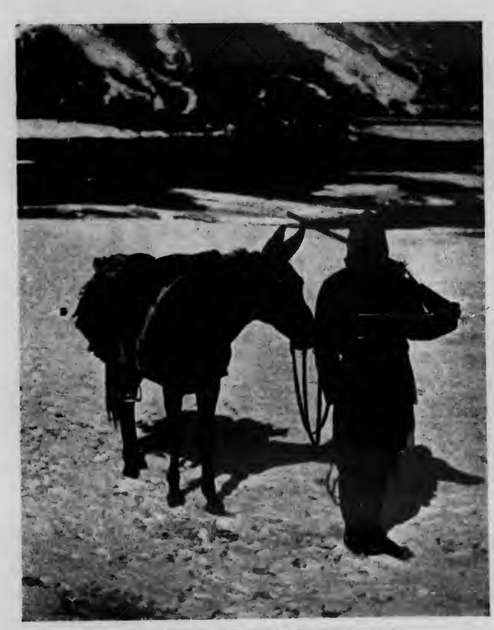
A CLOSE VIEW OF THE POTALA

Its size can be estimated from the yak-hair curtain hanging from the roof in the middle of the building; it is seventy feet long

A TIBETAN MONK WITH HIS PRAYER WHEEL

A TIBETAN WOMAN WEAVING

of the Commissioner's house were dug up, and the seeds which the Mission had brought from home were hopefully planted. Beans, peas, cabbage, scarlet runners, onions and mustard-and-cress were sowed with almost religious care—for which only the mustard-and-cress produced any returns. This gardener, a worthy Tibetan lady, was hired with her two husbands, and if her treatment of her spouses was characteristic of Tibetan domesticity, there is, perhaps, more to be said for the strange Tibetan marriage custom than a somewhat bigoted monogamous Englishman could be expected at first sight to admit.



A MEMBER OF THE EXPEDITION

Outfitted to cross the high passes of the Himalayas

A HORN HUT

In hovels like this live the Ragyabas, or breakers-up of the dead

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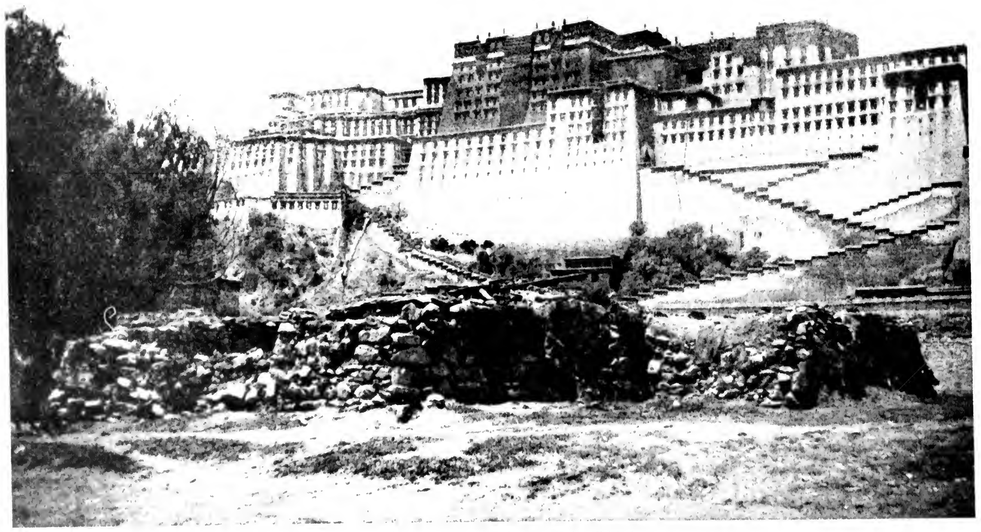

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A STREET GROUP IN A TIBETAN VILLAGE
Showing how the women dress their hair

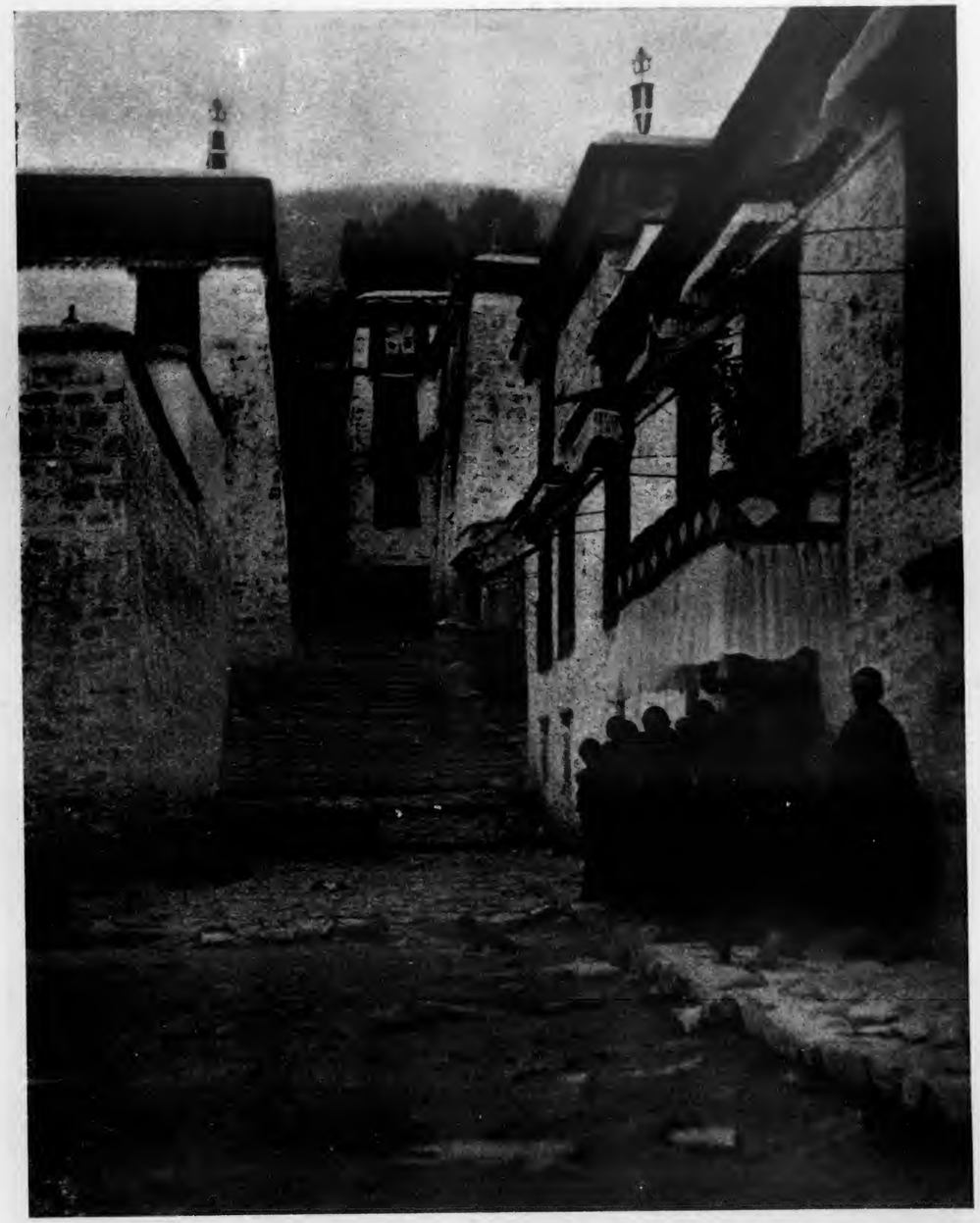
The habit prevalent throughout the country for a woman to marry all her husband's brothers as well as himself, naturally fills the nunneries, and the population of the country, whether due to this fact alone or not, is steadily decreasing. The plan, however, seems to work well enough so far as the family is concerned. These many-husbanded ladies seem to be able to keep a comfortable enough home with their changing housemates. The women, too, have developed a distinctly stronger character than the men.

THE HIGH PRIEST AT GYANTSE
"Who looks like a saddened Falstaff"

A LONG-HAIRED MONK AT HIS MONASTERY

AN IMMURED MONK

One day Captain O'Connor, the only member of the Mission who could speak Tibetan fluently, and I rode out down the valley to a monastery of the Nyng-na sect. We asked permission to see one of the immured monks.



A STREET SCENE IN THE BETTER PART OF LHASA
The roofs of the houses are made of golden plates

We climbed about forty feet, and the abbot led us to a small courtyard which had blank walls all around it, except that almost on a level with the ground there was an opening closed with a flat stone from behind. In front of this window was a ledge eighteen

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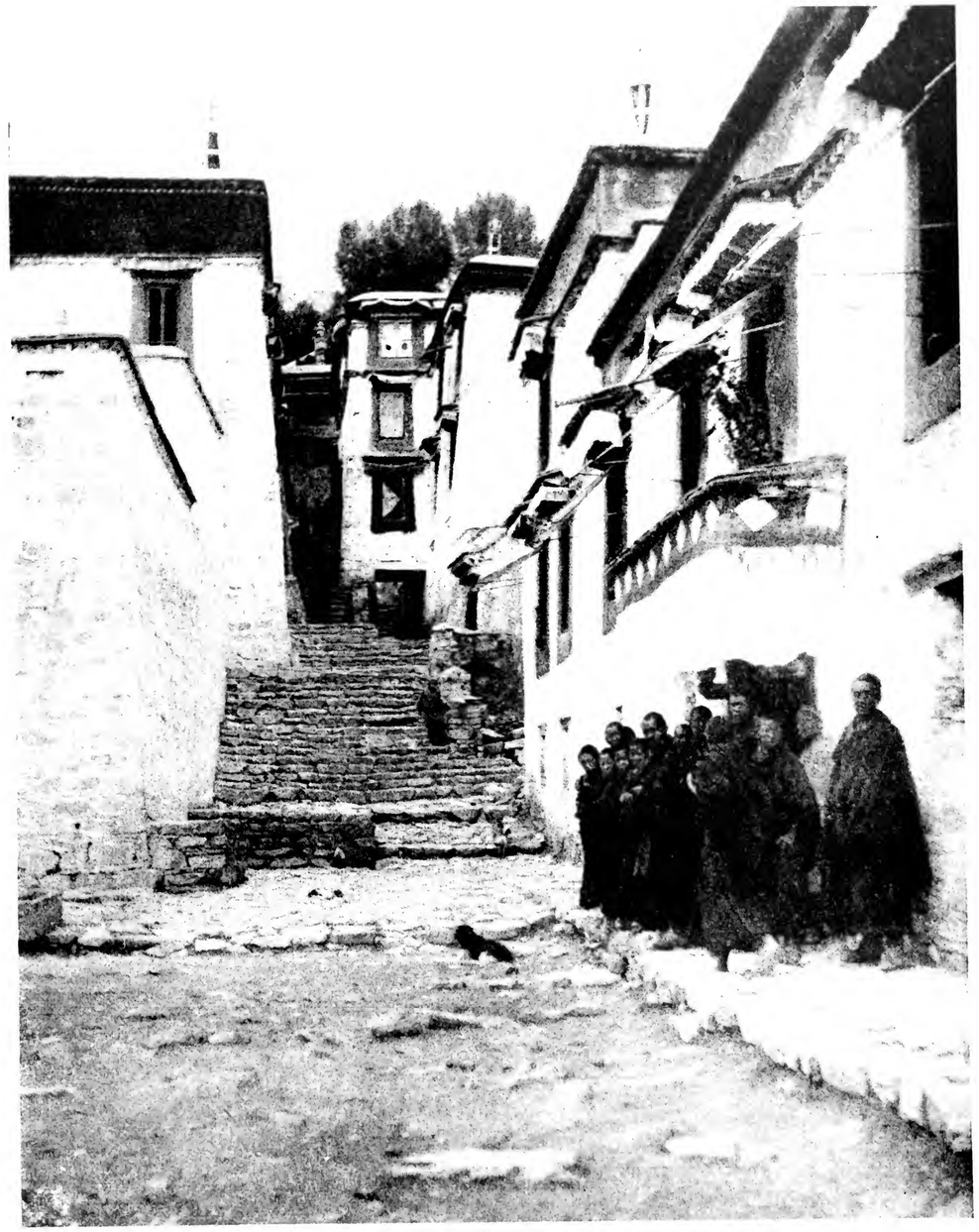

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THE GORGEOUS DECORATIONS IN A LHASA TEMPLE

ORNAMENTS OF A TIBETAN ALTAR

EXAMPLES OF TIBETAN-CHINESE WORKMANSHIP

inches wide. The abbot was attended by an acolyte, who, by his master's orders, tapped sharply on the stone slab. We stood in the little 15 x 20-foot courtyard and watched that wicket with cold apprehension. I think, on the whole, it was the most uncanny thing I saw in all Tibet. What on earth was going to appear when that stone slab, which even then was beginning weakly to quiver, was slid aside? The wildest conjecture could not suggest.

After a half-minute's pause the stone moved; then, very slowly and uncertainly, it was pushed back; a black chasm was revealed. There was again a pause of several seconds, during which imagination ran wild. I do not think that anything could have been so intensely pathetic as what we actually saw. A hand, muffled in a tightly wound piece of cloth, for all the world like the stump of an arm, was pushed up and very quickly felt along the slab. The hand, after its fruitless fumbling, slowly quivered back again into darkness, and after a few moments and one ineffectual effort, the stone slab moved noiselessly again across the opening.

Once a day water and an unleavened cake of flour are placed for these men upon that slab, the signal is given and the prisoner takes them in; his diversion is over for the day. These men, the abbot said, live here in this mountain of their own free will. "What happens when they are ill?" O'Connor asked. The answer was concise—"They never are."

IMAGES OF SOME OF THE GREAT BUDDHIST TEACHERS WORSHIPED BY THE TIBETANS

THE START FOR LHASA

The telegraph wire was with us almost from the beginning. Without the slightest question, it would have been cut in twenty places a day, if the Tibetans had had the least idea of the enormous value it was to us. "But we English," explained Captain Truninger, of the Mission, "are in a strange land, a land of which no foreigner has ever known any-

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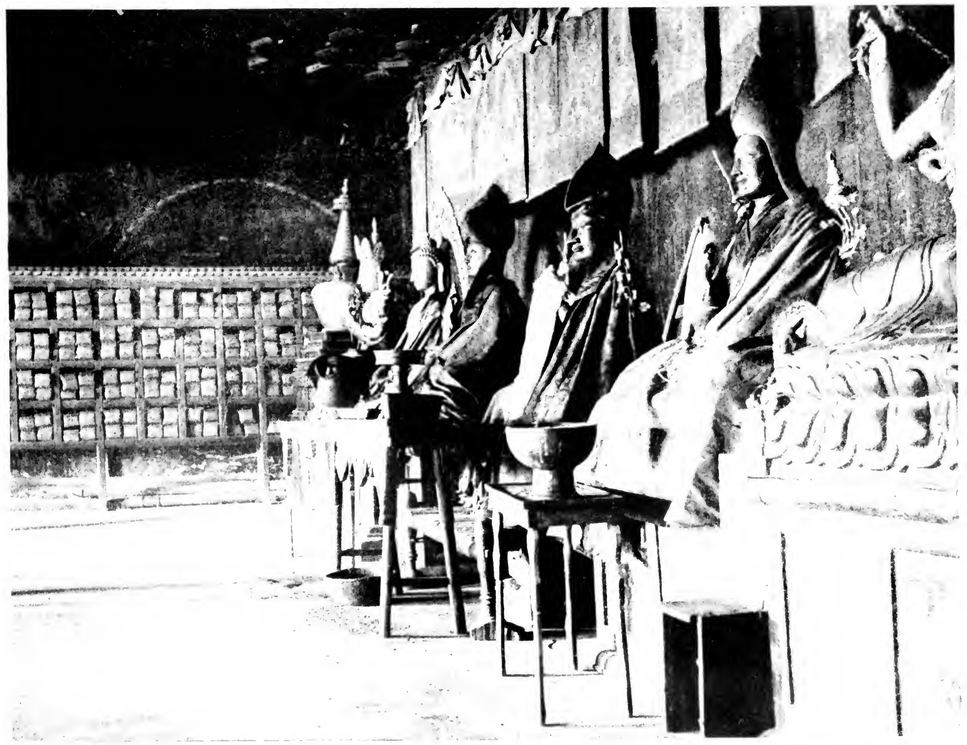

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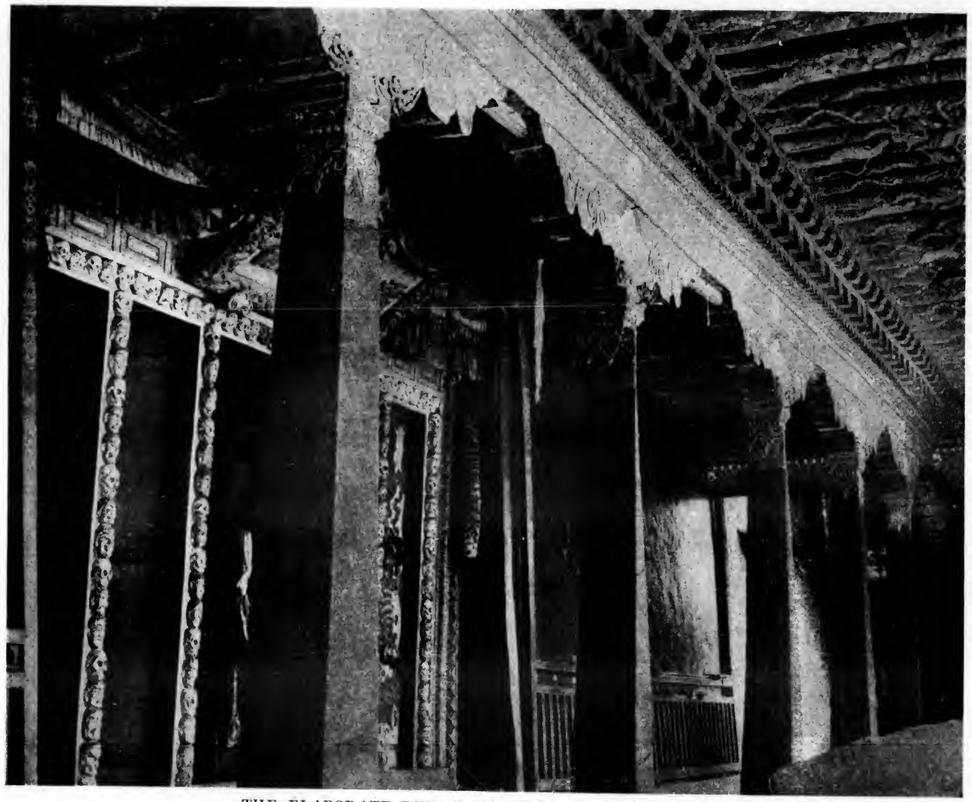

THE ELABORATE DETAIL OF TIBETAN ARCHITECTURE

THE FIRST SIGHT OF LHASA

You may see from afar the spot at which the first glance of the vast home of the Grand Lama at Lhasa may be obtained. Beside a barley field is a great heap of stones. There is not much else to mark the place. Then it came as we rode on. In the far, far distance, across and beyond flat fields of barley, and, here and there, the darker line of low-wooded plantations, a gray pyramid painfully disengaged itself from behind the outer point of the gray concealing spur—Lhasa.

Here, at last, the never-reached goal of so many weary wanderers, the home of all the occult mysticism that still remains on earth! The light waves of mirage dissolving impalpably just shook the far outlines of the golden roofs and dimly seen white terraces.

From end to end, the plain around the capital is almost without exception a water-sodden morass on which it is almost impossible to travel for a hundred yards without encountering a quagmire. The road by which one approaches the capital is a causeway built four or five feet up from the surface of the marsh, and pierced a dozen times by culverts through which brown, peaty water flows apace. In length the Plain of Milk, in the middle of which Lhasa lies, is about fifteen miles. In width it varies from two to five miles. And in upon it from all sides strike the spurs of vast mountains, which even then, in July, were snow-capped in the morning hours.

We halted for the night. For two hours and a half the camp was thronged with important dignitaries. There were the usual arguments, the usual prayers. But Colonel Younghusband did not hesitate; the treaty was to be signed in Lhasa itself, not signed one mile short of it.

LHASA

Lhasa would remain Lhasa were it but a cluster of hovels on the sand, but the sheer magnificence of the unexpected sight which met our eyes was to us almost a thing incredible. Lhasa is a city of gigantic palaces and golden roofs, surrounded by wild stretches of woodland, acres of close-cropped grazing land and marshy grass, ringed and delimited by high trees or lazy streamlets of brown, transparent water, over which the branches almost meet.

Between the palace on our left and the town a mile away in front of us there is this arcadian luxuriance, interposing a mile-wide belt of green. In this, Lhasa has a feature which no other town on earth can rival. Between and over the glades and woodlands the city itself peeps, an adobe stretch of narrow streets and flat-topped houses, crowned here and there with a blaze of golden roofs or gilded cupolas. But there is no time to look at this; a man can have no eye for anything but the huge, upstanding mass of the Potala palace to his left. It drags the eye of the mind like a lodestone, for, indeed, sheer bulk and magnificent audacity could do no more in architecture than they have in the palace-temple of the Grand Lama. Simplicity has wrought a marvel in stone, nine hundred feet in length and towering seventy feet higher than the golden cross of St. Paul's Cathedral. By European standards, it is impossible to judge this building. Perhaps in the austerity of its huge curtains of blank, unveiled, unornamented wall, and in the flat, unabashed slants of its tremendous southeastern face, there is a suggestion of the massive grandeur of Egyptian work, but the contrast of color and surroundings, to which no small part of the magnificence of the sight is due, Egypt cannot boast. The vivid white stretches of the buttressing curtains of stone, each a wilderness of close-ranked windows, and the home of the hundreds of the crimson-clad dwarfs who sun themselves at the distant stairheads, strike a clean and harmonious note in the sea of green which washes up to their base. Once a year the walls of the Potala are washed with white, and no one can gainsay the effect. Moreover, a brown yak-hair curtain, seventy feet in height and twenty-five across, hangs like a tress of hair down the very centre of the central sanctuary, hiding the central recess.

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Just where the dun town encroaches upon the greenery, you may see clearly the famous Turquoise-Roofed Bridge. To the right is the house of the Amban, the Chinese representative in Lhasa, almost completely hidden in its trees, and on the other side rise the steep, unbeautiful walls of the last house in Lhasa to the northeast; to the west of it flashes the corner of Ramo-che, the most sacred of all the temples in Tibet. But when you have marked these historic points, the eye will helplessly revert again to the Potala; it is a new glory added to the known architecture of the world.

To judge from our itinerary, the town of Lhasa itself would compare but badly with the capital of even a fifth-rate petty chief in India. The buildings lack distinction, though on a closer examination it must be confessed that the walls of the better houses were often soundly built and of strong material. Granite is used in large, splintered blocks for nearly every one of the bigger houses of the town.

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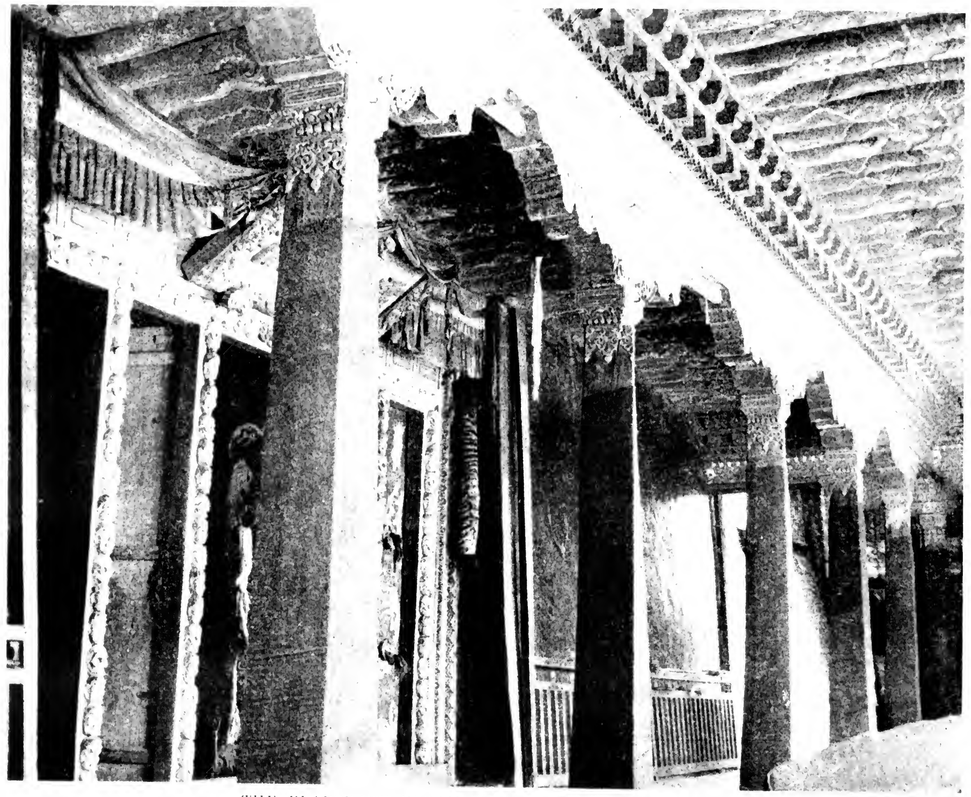

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famous tribe of Ragyabas, or beggar scavengers. These men are also the breakers up of the dead. It is difficult to imagine a more repulsive occupation, a more brutalized type of humanity, and, above all, a more abominable and foul sort of hovel than that which is characteristic of these men. Filthy in appearance, half-naked, half-clothed in obscene rags, these nasty folk live in houses which a respectable pig would refuse to occupy. A photograph is appended of a characteristic hut; it is about four feet in height, compounded of filth and the horns of cattle. These men exact high fees for disposing ceremonially of dead bodies. The limbs and trunk of the deceased person are hacked apart and exposed on low, flat stones, until they are consumed by the dogs, pigs and vultures with which Lhasa swarms. The flesh of the pigs is highly esteemed in Lhasa, and, indeed, it is as good as most pork to the taste, but after you have seen the Ragyaba quarter and heard the story of their dead, you will be little inclined to taste it again.

These men compose the only community peculiar to Lhasa. For the rest, lay and cleric alike, the inhabitants are entirely similar to those of the rest of Tibet. There is indeed but one difference even in the dress. In one province through which we passed the women use a turquoise-studded halo as a head-dress; in Lhasa, a fillet ornamented in the same way is bound close down over their hair, fluffed out on either side, and falls down over the shoulders. It is one of the most becoming ways of doing the hair that I have ever seen, and for a certain type the entire dress of a woman of Lhasa would be a becoming costume for a fancy-dress ball at home.

PILGRIMS ON THE SACRED WAY

The Ling-kor, or Sacred Way, incloses the city and the Potala palace with a loop of road, sometimes twenty feet wide, sometimes hardly three. It is now a wide expanse from which the noonday sun is fiercely beaten back; now a cool, firm path under the shade of poplars; now an up-and-down bridle-track worn smooth and slippery by millions of naked footfalls along the limestone cliffs; now a part of the filthy, swine-infested street which skirts the dirty Ragyaba quarter, three inches deep in black, iridescent mud.

From dawn to dusk along this road moves a procession, men and women, monks and laymen. They shuffle along slowly, not unwilling now and then to exchange a word with a companion overtaken—they all go round the same way and therefore meet no one—but, as a rule, with a look of abstraction from all earthly things, they swing their prayer-wheels ceaselessly, and mutter beneath their breath the sacred formula which shuts for them the doors of their six hells.

LIFE IN LHASA

The mission took up its residence in a house assigned to it by the Tibetan authorities. The only thing left in the house was a cheap pendulum clock made by the Ansonia Clock Company, in Connecticut. These very rare recurrences of western civilization did not affect the intensely oriental seclusion of Lhasa. One remarkable exception must be mentioned. Umbrellas, with the touching guarantee, "waterproof," pasted inside the peak, are fairly common there, whither they must have come from India, where their use is widespread.

While we were making investigations of the various temples and monasteries, negotiations were faring but ill; but there can be no doubt of our popularity with the laity. The market outside the town, which was formed in spite of the publicly expressed disapproval of the Council, was, from the first, crowded by hundreds of eager sellers, and it could have been but small satisfaction to the monks looking out from the walls of the Potala to see the densely crowded acre of chaffering pedlers. By eight o'clock in the morning a roaring trade was going on in curry powder, turnips, walnuts, sugar in yellow and white balls, cigarettes, apples (small russets with a tart flavor), sealing wax, acid-green peaches, native candles, lengths of cloth done up in soundly sewn wrappings, and other things, including tea. Tea in Tibet is imported in bricks glued with something that looks suspiciously like sawdust. A corner is knocked off a five-pound brick and is infused with boiling water in a tea-pot. The tea is then poured into a bamboo churn and a large lump of salt is churned up in it. Then a pound of butter is slid down into the bamboo and a minute's furious churning produces the liquid as it is drunk in Tibet. It is a thickish, chocolate-colored brew, sometimes strengthened with a little flour. As soup, it has certain very sound qualities as a meal in itself.

Cheap and tawdry are the only adjectives which can be applied to the interior decoration of the Potala. Part of it is fine in design, most of it commonplace, all of it dirty. The sacred heart and centre, however, not of Lhasa alone, but of Central Asia, is the Jo-Kang temple. What Tibet is to the rest of the world, what Lhasa is to Tibet, that the Jo-Kang is to Lhasa, and it is not entirely clear that any European or native spy has ever before ventured inside. The exterior is devoid of either beauty or dignity. The interior is unquestionably the most important and interesting thing in central Asia. It is the treasure-house, not of the country alone, but of the faith, and it is curious that while the magnificent Potala is a casket containing nothing either ancient or especially venerated, the priceless gems of the Jo-Kang are housed in a building which literally has no outside walls at all. The sanctity of the temple obviously increased as we ventured into the inner court. Once inside, the eye required some time to distinguish anything more than the dim outlines in the middle of the chamber. After a little, one could just distinguish the solemn images squatting round the walls, betrayed by points and rims of light reflected here and there from the projections and edges of golden draperies or features. The air was exhausted and charged with rancid vapors. Everything one touched dripped with grease. The fumes of burning butter have in the course of many generations filmed over the surface and clogged the carving of doors and walls alike. The floor underfoot was slippery as glass.

The first sight of what is beyond question the most famous idol in the world is uncannily impressive. Before him are rows and rows of great butter-lamps of solid gold. Lighted by the tender radiance of these twenty or thirty beads of light, the great glowing mass of the Buddha softly looms out, ghost-like and shadowless. The crown is perhaps the most interesting of the many jewels. It is a deep coronet of gold, set round and round with turquoise, and heightened by five conventional leaves, each inclosing a golden image of Buddha and incrusted with precious stones. In the centre, below the middle leaf, is a flawless turquoise, six inches long and three inches wide, the largest in the world.

PRIESTLY CONTROL OF TIBET

Except in so far as Buddha's face of quietism personified still gazes down from wall and altar upon the rites of Lamaism, the Tibetan religion is a system of devil-worship, pure and simple. Always at the summit of a pass, at the entrance of a village, at a cleft in the rock-side, at the crossing of a stream, by bridge or ford, one is accustomed to find the flicker of a rain-washed string of flags, a glittering prayer-pole, or a gaily dressed brush of ten-foot willow sprigs; evil spirits must be exorcised at every turn in the road. And not a pole is set up, not a string of flags pulled taut, not a water-wheel or wind-wheel set in motion without the customary fee to the priest. Cairns are set up at small intervals along the road. They may be passed only to the left, and their position at the edge of the cliff often renders this a hazardous proceeding in one direction. After living in the country for a few months, the least thoughtful man in the force usually followed the superstition as he walked along. We soon realized that the control of the Lamas over the souls of their flock was used solely to secure also an unlimited tyranny over their possessions. The riches of Tibet are, almost without exception, enjoyed by the priestly class. An interesting use of the doctrine of reincarnation has been a political lever. The present Dalai-Lama made a sudden and convenient discovery that Tsang Karpo, the great reformer of Lamaism, was reincarnated in the Czar of Russia. The guardian of the country, the Chinese Emperor, is also a reincarnation. Paldenlhamo, one of the figures in the Tibetan pantheon, is a dark-blue lady with three eyes, who sits upon a chestnut mule, drinking blood from a skull, and tramping under foot the torn and mutilated bodies of men and women. For this atrocity the Tibetans found a representative in Queen Victoria.

But enough. After our visit to the Jo-Kang I set off before dawn next morning on my long ride back to India, carrying despatches both to the Viceroy and to the Home Government. Since the expedition returned, China has refused to ratify the treaty Colonel Younghusband negotiated at Lhasa; so affairs are much as they were before, except that the veil has been lifted from the mysteries of Tibet.

Tibet

Natural History, Sept.-Oct. 1920.

Objects That Symbolize the Common Life in Tibet

With reference to a new and very valuable collection recently obtained by the American Museum from southern Tibet

THOSE who are in the habit of visiting the anthropological halls of the American Museum to study the customs of far-away peoples will be glad to learn of a recent valuable accession from Tibet.[1] The collection was made by a medical missionary, the Rev. H. B. Marx, through a period of sixteen years' residence at a Moravian mission on the southern Tibetan border. The mission buildings are on the Indian side, suffice it to say, not on Tibetan soil, and that Dr. Marx has been able not only to maintain cordial relations with this unfriendly country, but also to bring together a collection of objects representing the common life there, reflects on both the high character of his personality and the gratitude the Tibetans have felt for the medical service he has given.

The Tibetans have always borne toward the rest of the Orient excessive exclusiveness both political and religious, especially during the nineteenth century and later when elsewhere civilization has been rapidly advancing, which leaves them today in the anomalous position of a living but almost fossil race. Even their country, a million miles square and the highest of the globe, with valleys ranging from 12,000 to 17,000 feet above the sea, is little known. From India at the south they have kept a commanding barrier by the almost unscalable mountains—as well as by their aggressive, suspicious nature and very different social life. Dr. Marx, however, from the mission at Poo, India, was allowed to penetrate considerable distances in different directions, and the collection which he has brought out has been selected with thought for high scientific value in depicting national custom.

The tea-drinking habit in Tibet, for instance, is suggested in the paraphernalia for making "buttered tea": a low table of red and black lacquer (behind which the Tibetan sits with crossed legs on the floor or on a small woolen rug of Tibetan weaving); either a wooden or a china cup for the tea, with a metal saucer-like stand and a cover; the teapot of brass or silver, attractive in shape and elaborately decorated; and the small churn with metal ornamentation. The hot tea is mixed with rancid butter and ground barley into a kind of broth, the so-called buttered tea, or perhaps is compounded with a larger amount of barley into small brown cakes. That the cup fits into a covered metal box and the table collapses into a form convenient for transportation intimates the habitually large amount of slow travel there is in Tibet by primitive methods from one remote center of population to another. Tea is imported from China in enormous amounts. The official report of duty covers the entrance of more than ten million pounds annually. Most of this is of an inferior quality, compressed into large bricks of about five pounds weight, which are so universally used throughout the realm that they have come to be passed as currency.

One can read correctly very much of the life of the Tibetans from these isolated objects. Hobbles, stirrups, and racing harness tell the very considerable part the Tibetan ponies take in pastime and travel; the woolen industry is illustrated from clipping the wool through spinning and weaving to the finished shawl. There are bleeding cups and crude lancets and the like to reveal the primitive state of medicine and surgery; pipes, bags, and boxes explain the large use of tobacco and opium; and there are various musical instruments, the oboe of the beggars, the primitive guitar and flute, and especially the drum and bell of the noisy music of the lama festivals.

It would be evident from the collection,

[1] Presented through the generosity of Mr. J. P. Morgan, New York City.

SUGGESTIVE OF THE PREVALENT TEA-DRINKING HABIT IN TIBET

The teapot is of Chinese importation. The Tibetans do not make any ornamental metal work. The table of red and black lacquer spreads out into considerable size or collapses into form convenient for transportation on the long, slow journeys the Tibetans make over their inhospitable and thinly settled country. Also, the bowl for tea fits into a covered metal box (at the left) for safety during travel. "Buttered tea," a staple food in Tibet, is made by mixing hot tea with rancid butter and stirring into this ground barley to broth consistency—or in larger amount to form small cakes

LAMA COSTUMES WORN IN A CEREMONY FOR "DRIVING OUT THE DEMON"

At the left are the musicians with drum, cymbals, and bell. One lama carries the lasso to catch the fleeing demon, a second the chain to bind him, a third the skeleton club to deal the death blow, a fourth the sacred lama dagger and the skull in which is caught the blood to serve as a vigor-giving drink to the lama. This fourth lama (at the right) is wearing the very sacred mask of the five skulls, representative of slain demons, and the breast regalia of carved lama bones. The ceremonial robes are of heavy silk, gold embroidered. These objects are all in the possession of the American Museum, which hopes at some time in the future to build a group depicting the demon dance in the court of a Tibetan temple (see page 472)

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too, that religion plays a large part in the life of Tibet, and that this religion[1] tends toward sorcery, ritualism, and magic. There are clay idols and the copper molds for making them; there are amulets for protection against sickness, bad dreams, and fears in the dark, or to be worn during what they consider the "dangerous" years of life, a dozen years apart (thirteen, twenty-five, thirty-seven, forty-nine, sixty-one, seventy-three); there are nuns' rosaries carved in shell; a prayer wheel is filled with a sheaf of thin round leaves of paper, each printed with many repetitions of a common prayer, ready to be brought by the whirling of the wheel to the attention of the Merciful One begging him to have the world in mind and help all human kind; there is a prayer stone with its engraved prayers, such as cover the stones in the thousands of prayer walls in Tibet, all addressed to the same Merciful One for the good of mankind.

Sacred relics called "potted lamas" intimate the strong barbarous element in a people saturated in the horrible incident to life and death. These objects are made of crushed human bones and clay, referring to the Tibetan custom of disposing of their dead priests by throwing aloft small portions of the flesh cut from the body to be caught by the circling birds of prey, and crushing the bones to be mixed with clay and pressed by means of metal molds into these relics.

The collection contains the powerful lama dagger carried in a ceremonial dance of the lamas called "driving out the demon." The dancers, called "demon dancers," represent the warriors of Tibet's ancient demon worship. There are the lasso used by the warrior to catch the fleeing demon, the iron chain which fetters him, the skeleton club which deals the death blow, and the skull in which is caught the blood to serve as a vigor-giving draft to the warrior.

All these objects, together with the masks and the silk and gold-embroidered robes of symbolic colors worn by the officiating lamas in the ceremony, are a part of the new accession. The museum will have under consideration the possibility of exhibiting them at some time in the future, with the assistance of Dr. Marx, on figures in an anthropological group, thus portraying one stage in the demon dance just as it takes place in the court of the Tibetan temple. Fortunately for this, the collection contains also the regalia consisting of ornamental apron and breastplate made of carved bones of sainted lamas; and also the very sacred mask of the five skulls, representing slain demons, which is worn by the lama who carries the sacred dagger. This ceremony and many of the others of Tibetan religious festivals performed by the lamas, it is said, present a considerable analogy to various mediæval mystery plays.—THE EDITOR.

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THE HINTERLAND OF THE HIMALAYAS

Photographs from Lewis R. Freeman

Lamasery (Monastery) in Bhutan, one of the small "buffer" states between India and Tibet. At least one son in every family becomes a lama or priest of the Tibetan form of Buddhism. The walls of the buildings are of stone and the roofs of slate. The overhanging eaves of the latter are strongly suggestive of the Swiss châlet

Devil dancers at a Ladakhi wedding. Ladakh—often called "Little Tibet"—is the name given to the eastern and most mountainous portion of Kashmir. Its least altitudinous city is Leh, the capital, 12,000 feet above sea level, and Himalayans from the higher mountains often complain of the "debilitating" effect of the heavy air on visiting there. The "devil dancers" at the wedding feasts are usually lamas hired to exorcise evil spirits, and to this end they are made up to "outdevil the devil," as the photograph well illustrates

F.G.R.G.S. TRAVEL

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This photograph, which shows the Maharanee, or Queen of Nepal, with her maids-in-waiting, is only another example of the truth that there is nothing new under the sun, even in fashions. She is wearing a skirt almost identical with the crinoline of the middle of the last century. In Her Majesty's court costume of the present day the "spread" is secured by slender hoops of steel, such as performed similar duty under the skirts of our grandmothers; but before Nepal enjoyed relations with the outer world, the crinoline effect was obtained by the use of slender strips of bamboo

A famous chief of Bhutan and his councilors and henchmen. The "mural" decorations are done in a red native pigment, and among them may be noted a swan, a horse and—in the center—a sort of conventionalized beetle. These decorations bear a certain resemblance to the pictographs which have been found in the cave dwellings of primitive man in various parts of Southern Europe

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Chortan or sacred altars in Ladakh. These vary in size from simple little piles at the forks of mountain trails to the rather imposing monuments around the temples. In passing one a native always murmurs the sacred formula "Om mani padme hum," which roughly translates into "Oh, the jewel of the lotus!"—that is "Buddha," who was supposed to have sprung from a lotus flower

The Army of the Maharajah of Nepal in review on the Plain of Khatmandu. Nepal is the remarkable little Himalayan state from which, for many years, India has drawn its wonderful little Ghurka soldiers.

Kashmiri farmers on their way to market. As in all primitive communities, exchange in Kashmir is more often a matter of barter than of direct sale, and this exchange takes place in the village bazaars, which serve as clearing houses for merchandise and gossip

Kashmiri shawl weavers. The Kashmir shawl, usually made from the hair of the native goat, has been famous from the time of the Moguls, through whom it was brought to India and ultimately to Europe

A mountain scene in Sikhim. The pole in the right foreground is for "praying flags." On each of these flags the sacred formula "Om mani padme hum" is written, and the belief is that every time the strip of cloth flaps in the wind the prayer is repeated

A Ladakhi bride in full wedding regalia. Ladakh is one of the very few places in the world where polyandry prevails. A girl marrying the eldest brother of a family automatically becomes the wife of all the younger ones, with the exception, of course, of the member who has become a lama. The maids left over usually become nuns, the number of these being very large

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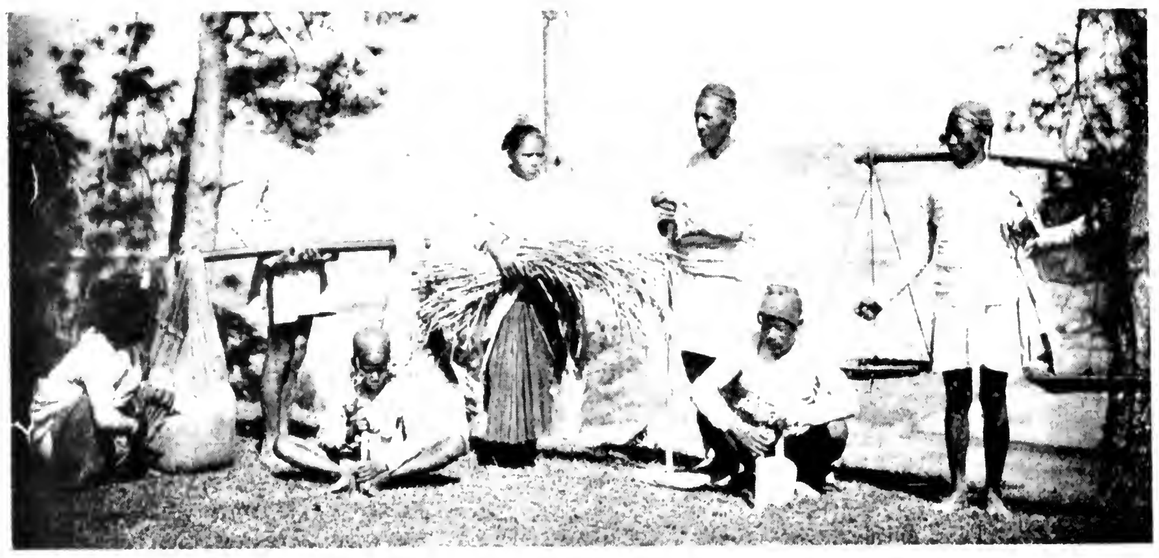

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A precarious trail in Sikhim. Owing to the enormous rainfalls in the Himalayan states to the northeast of India—often from 500 to 700 inches a year—the erosion is so great that trails are obliterated every few days. In some of the worst exposed places bamboo bridges, such as shown in the illustration, are hastily built to get around destroyed trails. Even these crazy improvisations hold no terror for the sure-footed, steady-headed pack coolies

Dancing girls of Nepal. The "nautch" girls of India are hardly beautiful from the Occidental point of view, and their dances—a series of inelegant wrigglings—have little in common with the idealized forms of Oriental dances seen on our Western stages

Brass workers of Kashmir. "Every man to his trade" has even more force in India than in the Occident, for there trade often means "caste," and a boy must follow the calling of his father, as must his own son after him. It is this specialization that is responsible for the rare craftsmanship of the artisans of India

Tribesmen of the Afghan frontier. These men are of the class that have kept the northwestern frontiers of India in a more or less state of siege for many years. They are usually nomads of one kind or another

Yaks near Leh, Ladakh. These strange Himalayan beasts of burden, though in appearance as awkward as oxen, are really as sure of foot as goats. Their normal habitat is above the 10,000-foot level, and they invariably sicken and die if kept long below that altitude. Their hair is much prized for ropes and tent fabrics

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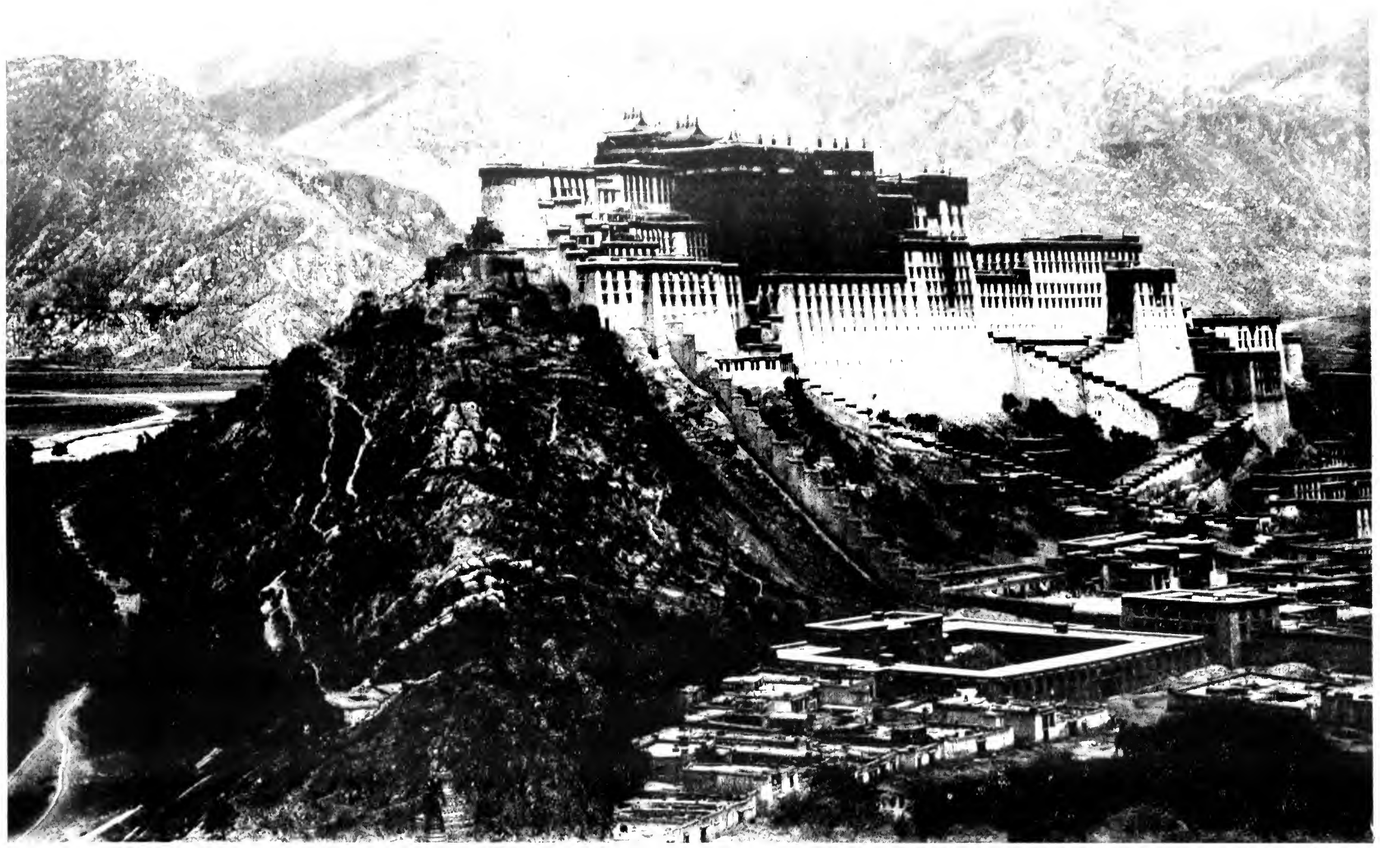

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Yaks near Leh, Ladakh. These strange Himalayan beasts of burden, though in appearance as awkward as oxen, are really as sure of foot as goats. Their normal habitat is above the 10,000-foot level, and they invariably sicken and die if kept long below that altitude. Their hair is much prized for ropes and tent fabrics

Above, a Bhutani chief and his military escort. The offensive weapons of the latter are swords and clubs, and for defense they depend upon round shields of brass. Their heavily quilted clothing will usually turn a cut from a blunt Tibetan sword, and their fights are rarely attended with fatalities

Below, the evening halt of a company of Bhutani soldiers. At meal time these doughty warriors squat in rows and their food—usually barley gruel and tea churned up with melted butter—is brought around to them. Fires are made of dried yak dung, as the nearest trees are many thousands of feet below. The cloth of the tents is made from yaks' hair

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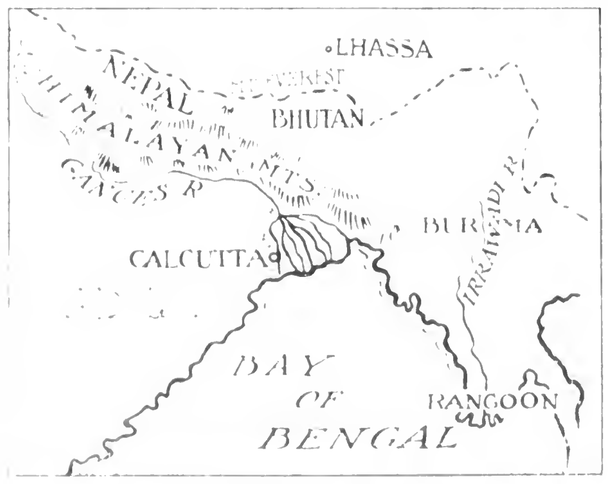

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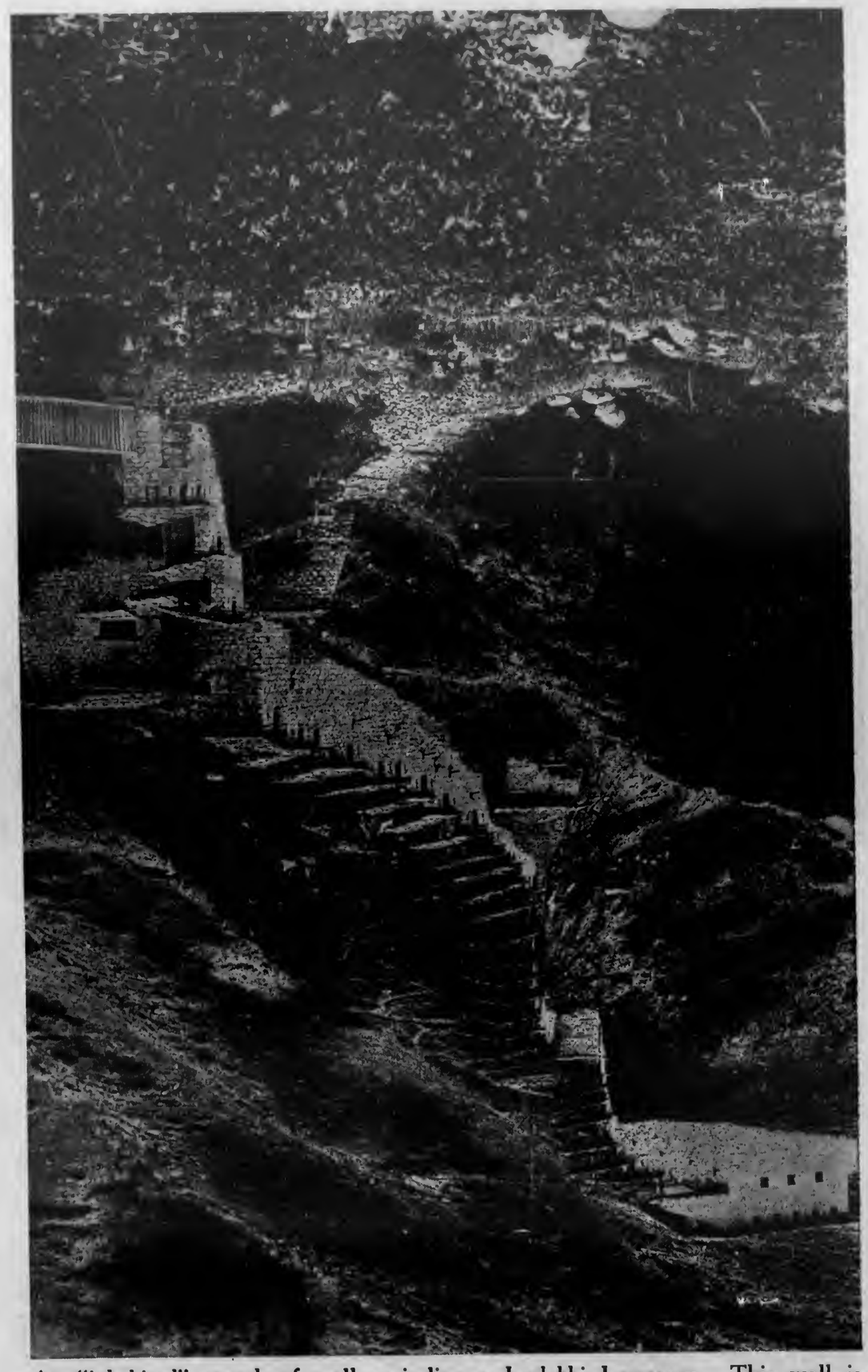
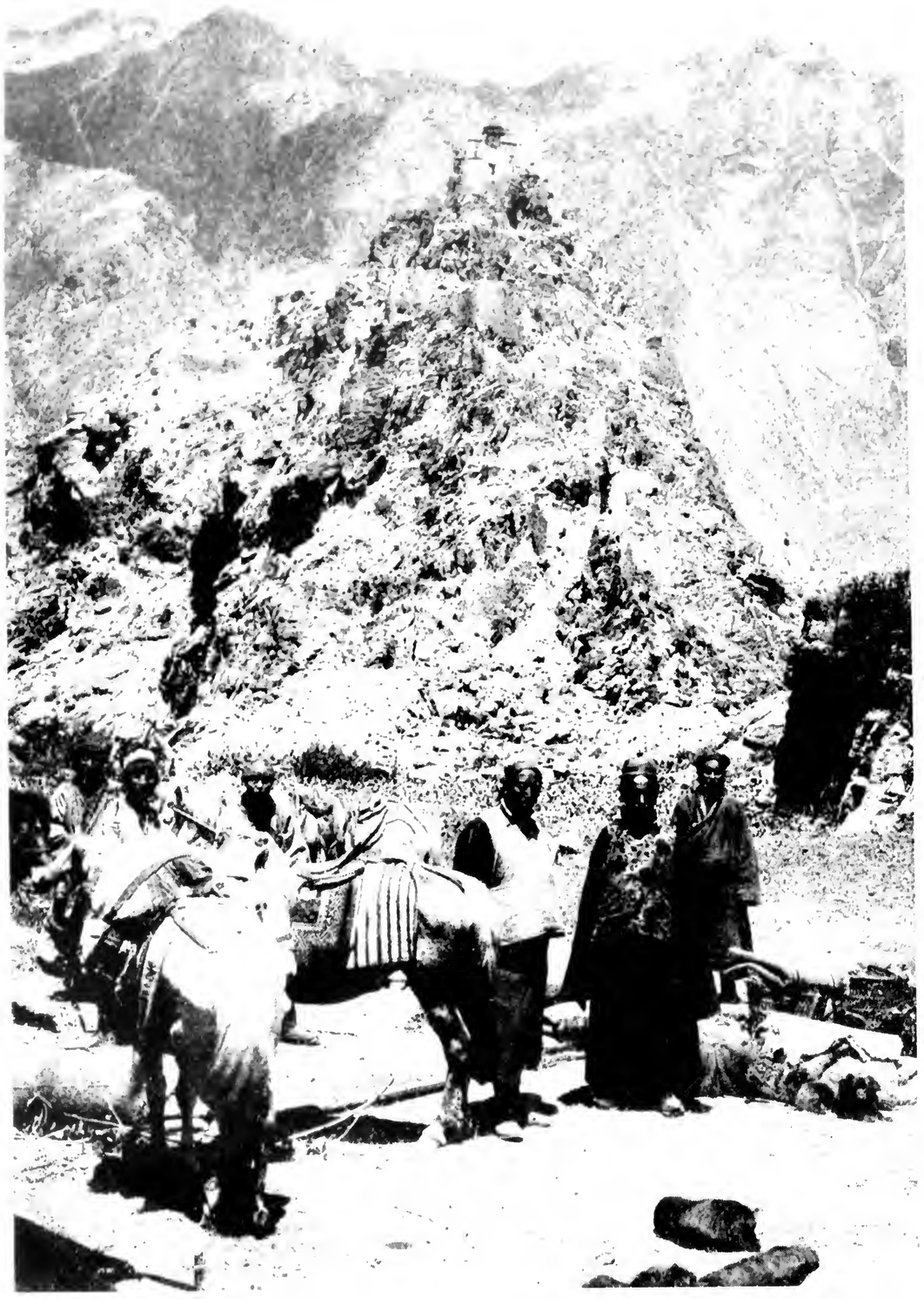
Chinese merchants of Tibet on the march. Tibet is still nominally suzerain to China, a small annual tribute is still paid, and adventurous Chinese merchants still reside in Lhassa and trade across the "Roof of the World" with their own country. A remarkably situated lamasery may be descried on the peak in the background



An "inhabited" stretch of wall encircling a Ladakhi Lamasery. This wall is roofed and divided into cells in which numerous lamas are domiciled. Some of the more sacred of these have been walled in and only receive their food through a hole left in the stones for that purpose

Sunset on a Tibetan lake near Gyangtse. This point lies on the road which comes from India via Darjeeling. The prospect is as "open"—as "un-shut-in"—as any to be seen in all Tibet, where one's eyes are usually seeking the sky at an angle of over forty-five degrees



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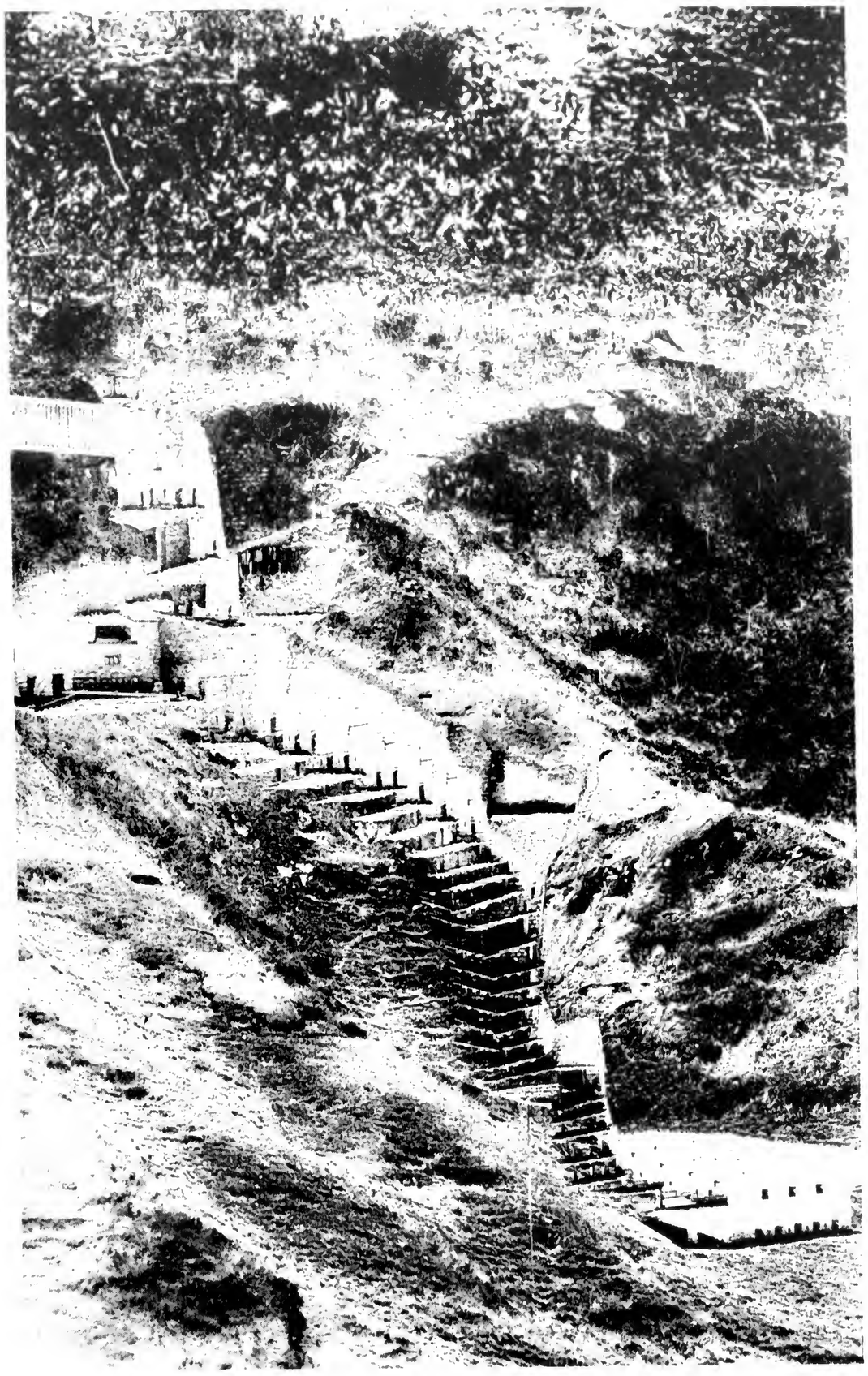

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Digging Up India's Past Reveals "Modern" Houses

AMERICAN archaeologists have unearthed a buried city in India, showing more vividly than ever before what the most ancient civilization of India was like.

The ruins, found under mounds of earth at Chanhu-daro, northwestern India, date back five thousand years in their oldest era. The modern world can find much to wonder at, in ruins and relics of the dead city.

Chanhu-daro had homes of burnt brick, and the brick was of well-fired clay and well shaped. The houses had bathrooms and drains that are pronounced superior to the sanitary arrangements in cities of other civilizations of their time. The people were industrious at many lines of skilled labor. They made toys for children of cities around the country. They were workers in bronze and copper. They turned out quantities of beads, making some so tiny that forty to an inch could be strung, and boring holes so fine that nothing coarser than a hair would thread these beads.

As Chanhu-daro was on a trade route, the goods of the city were dispatched by ox-load or peddler's pack to other, distant cities.

The picture of a trade town of ancient India, as old as the famous ruined city of Mohenjo-daro, is the result of excavation by two institutions, the Boston Museum of Fine Arts and the American School of Indic and Iranian Studies. It is only within three years that the Indian government has changed its law, to permit outside universities and archaeological organizations to dig in this region.

The Indus Valley, where Chanhu-daro stood, had its trouble with floods, like Ur of the Chaldees and many another ancient town. The field director of the expedition, Ernest Mackay, finds that at least three great floods attacked the city. After such a flood, the people were forced to leave the place entirely, and in some sequences of the city's history debris piled over the abandoned ruins before settlers came to rebuild.

After the Harappa culture, as the oldest civilization at this site is named, there followed a people of about 2000 B.C. who lived in matting houses, and had only rough paving under their feet. These people made great quantities of pottery which the archaeologists hope will shed more light on the migrations and trade relations of their era.

Chanhu-daro seems to have had its greatest importance early. The later settlements shrank. Last on the site were a few primitive folk who made dark gray pottery and marked it with geometric designs. This curious ware is unfamiliar even to archaeologists well acquainted with the clay styles of the past. Wandering gypsy-like tribes, Mr. Mackay believes, may have been the last industrialists in the once-flourishing trade city.

Science News Letter, November 7, 1936

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BENARES

SEMINAR ON
INTERDISCIPLINARY INDIAN STUDIES

(SUMMARY REPORT)

POONA
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Printed at the G. S. Press, 21, Narasingapuram Street, Mount Road, Madras, and published by Dr. S. M. KATRE for the Deccan College Post-Graduate and Research Institute, Poona-6

INTRODUCTION

It gives me real pleasure in publishing this short report of a Seminar on Interdisciplinary Indian Studies convened by Professors Norman BROWN and Milton SINGER which met in the Deccan College on November 18, 19 and 20, 1954. During the spring of the same year I had the unexpected privilege of being in Chicago when the first seminars and conferences were inaugurated by Professors REDFIELD and SINGER of Chicago University and of attending one of its sessions. Arising from this chance meeting, the Deccan College has been privileged to become the venue for the first of such interdisciplinary seminars in India sponsored by the University of Chicago. The Deccan College has a special interest in these seminars, for its own present structure in specialising in certain branches of humanities and social sciences has been based on the realisation of the need for such interdisciplinary approaches to regional studies.

The present brief report is preliminary, we hope, to the publication of a volume containing the papers contributed to the Seminar and edited by Professor Norman BROWN under the joint auspices of the University of Chicago and the Deccan College. Our deepest thanks go to all those scholars who participated in making this Seminar a success, and in particular to Professors Norman BROWN and Milton SINGER who bore the greater share in its organisation as convenors and to the University of Chicago for making a special grant towards the cost of this Seminar.

25th March, 1955. S. M. KATRE

SEMINAR ON INTERDISCIPLINARY INDIAN STUDIES

A seminar on Interdisciplinary Indian Studies was held at Poona on November 18, 19 and 20, 1954 under the auspices of the Deccan College Post-Graduate and Research Institute. The seminar was convened by W. Norman BROWN, Professor of Sanskrit and Chairman of South Asia Regional Studies at the University of Pennsylvania, and Milton SINGER, Professor of the Social Sciences at the University of Chicago.

The purpose of the Seminar was to bring together some Indians and some Americans seriously concerned with the future of Indian studies in the United States and in India for an exchange of views and for the exploration of possibilities of specific forms of cooperation.

The Agenda for the Seminar was set as follows :—

Thursday : 2-30 p.m. to 5 p.m.	Welcome by S. M. KATRE, Introductory Comments by D. R. GADGIL.
	Purpose and Background of the Seminar, statement by Milton SINGER.
	Trends in Indian Studies in the United States, statement by W. Norman BROWN.
Friday : 1-30 p.m. to 5 p.m.	Variety and Integration in the Pattern of Indian Culture, discussion to be opened by V. RAGHAVAN.
	Variety and Integration in the Pattern of Indian Languages, discussion to be opened by S. K. CHATTERJEE.
	What Do Village Studies Tell Us About Indian Culture and Society? Discussion to be opened by V. M. DANDEKAR.
Saturday : 10 a.m. to 12-30 p.m.	The Planned State in Ancient and Modern India, discussion to be opened by A. S. ALTEKAR and D. G. KARVE.
Saturday : 2-30 p.m. to 5 p.m.	The Study of Urban Castes and Classes and their Political Economic Roles, discussion to be opened by D. R. GADGIL.

Present Status and Needs in Social Science Studies in India, discussion to be opened by D. N. MAJUMDAR.

Sunday: Sightseeing:
(Visit to Karla, Bhaja, Bedsa, and School of Yoga at Lonavala).

Active participants in the Seminar included the following:—

Prof. A. S. ALTEKAR, Professor of Ancient Indian History and Culture, Patna University, Patna 6.

Prof. W. Norman BROWN, Professor of Sanskrit and Chairman of South Asia Regional Studies, University of Pennsylvania.

Prof. S. K. CHATTERJEE, Emeritus Professor of Comparative Philology, Calcutta University and Chairman, West Bengal Legislative Council, Assembly House, Calcutta 1.

Dr. Y. B. DAMLE, Sociology, Deccan College, Poona 6.

Dr. V. M. DANDEKAR, Statistics, Gokhale Institute of Politics & Economics, Poona 4.

Dr. Roger EVANS, Asst. Director, Social Science Division, Rockefeller Foundation.

Prof. D. R. GADGIL, Director, Gokhale Institute of Politics & Economics, Poona 4.

Mr. Chadbourne GILPATRIC, Rockefeller Foundation, New York.

Dr. John GUMPERZ, Linguistics, Cornell University.

Mr. R. Wade JONES, Consultant on Program Evaluation and Adviser to Ford Foundation Research Fellows in India, 32, Ferozshah Road, New Delhi.

Prof. D. G. KARVE, Planning Commission, Program Evaluation, Secretariat, New Delhi.

Dr. Irawati KARVE, Deccan College, Poona 6 (Sociology and Anthropology).

Dr. S. M. KATRE, Linguistics and Director, Deccan College Postgraduate and Research Institute, Poona 6.

Prof. S. V. KOGEKAR, Political Science, Fergusson College, Poona 4.

Dr. V. K. KOTHURKAR, Psychology, University of Poona.

Prof. D. N. MAJUMDAR, Anthropology, and Head of Department, University of Lucknow.

Prof. V. RAGHAVAN, Sanskrit, and Head of Department, University of Madras, Madras 5.

Dr. H. D. SANKALIA, Pre-history and Archaeology, Deccan College Research Institute, Poona 6.

Prof. Milton SINGER, Social Sciences, University of Chicago.

Dr. Merill GOODALL, Political Science — Lucknow-Cornell Research Center, Cornell University, and

Prof. M. N. SRINIVAS, Social Anthropology, Baroda University, who were scheduled to participate were prevented from attending by unforeseen circumstances.

Part I: *Needs, Trends, and Organization of Indian Studies.*

The discussion at the Poona seminar dealt with two broad groups of problems: (1) the present needs, trends, and organization of Indian studies in the United States and in India, and (2) the problem of variety and integration in Indian culture.

In his remarks opening the seminar, Professor GADGIL pointed out that the Indian interest in interdisciplinary Indian studies could not be the same as the American interest, i.e., a desire to counter the trend to over-specialization, since the degree of specialization in India was not very great. Nevertheless, he believed that the seminar would be of the greatest service, because it would help Indians in the process of self-discovery that has been precipitated by the present period of transition in India. He personally felt that there has been a loss of nerve among Indian intellectuals who are not facing up to the problem of working out a combination of the old and the new in Indian life but are tending to formulate their problems too much in Western terms. Such formulations could be inappropriate to Indian conditions and ideals. Professor GADGIL gave two examples of such formulations. The problem of liberty versus equality was usually formulated in terms of the greater importance of liberty, which was a Western preference. In India equality is the more basic idea. Again, on the question of incentives, inequality of reward is usually assumed to be essential, but Professor GADGIL wondered whether it is not possible for the intellectuals in underdeveloped areas to work out a different solution for this problem.

Explaining the background of the seminar, Professor SINGER said that it was one of a series of international seminars and conferences designed to stimulate a better organization of available knowledge of the civilizations of Asia and the West and to improve methods for their study and comparison. This series is being sponsored by a program on intercultural studies directed by Robert Redfield, Professor of Anthropology at the University of Chicago, and is being supported by a special grant from the Ford Foundation. These

activities are centered at the University of Chicago but their personnel and scope is international.

Previous seminars and conferences have dealt with Chinese thought, Chinese ideologies and social institutions, Islamic cultural history, the variety and unity of Muslim civilization, the methodology of comparative cultural studies, and related topics. Proceedings of these are being published in a special memoir series—Comparative Studies of Cultures and Civilizations—of the *American Anthropologist*, with editorial offices at the University of Chicago.

The first seminars and conferences on India were launched by Mr. REDFIELD and Mr. SINGER during the spring of 1954 at the University of Chicago with a small conference attended by Professors W. Norman BROWN, Robert CRANE, Daniel INGALLS, S. M. KATRE, David MANDELBAUM, and Richard PARK, and Messrs. Chadbourne GILPATRIC and Phillips TALBOT, and with a seminar on the Indian village which heard reports of their recent field studies from Alan BEALS, Bernard COHN, Kathleen GOUGH, Oscar LEWIS, David MANDELBAUM, McKim MARRIOTT, and Gitel STEED, the participants coming from various parts of the United States for the conference and the seminar. As a direct result of these meetings practical efforts are now under way to organize a South Asia Association, to issue a regular newsletter and to continue with annual seminars and conferences on India and South Asia.

Mr. SINGER said these efforts were but several among many scattered ones being undertaken in the United States to improve communication and knowledge about India. To Indians, such efforts might appear frenetic and superficial, but he hoped they would be patient with them and see this surge of American curiosity about India as an expression of a felt need to understand rapidly changing world events and India's growing importance in them. Americans are in a hurry to catch up with Indians.

An interdisciplinary approach, he thought, is quite essential for understanding India, because most Western social scientists coming to India lack the background knowledge about the Indian scene necessary for applying a specific discipline, and because the social sciences have been developed more in relation to European and American conditions than in relation to Indian conditions. It is quite possible that objective study of India will change our old disciplines and perhaps create some new ones.

Mr. SINGER said he could not speak dogmatically about the best form of interdisciplinary organization. In the United States, there is a great variety of Indian Studies programs—from the fully integrated and comprehensive South Asia program organized by Professor BROWN at the University

of Pennsylvania to the more dispersed types at California, Cornell, and other Universities. The pattern in each case depends on the resources and organization of the educational institution, and on the leaders of the program. Such variety is healthy, because it affords latitude for the experiment and exploration essential to a new and growing field of knowledge. The present seminar is itself an experiment in communication across disciplinary and cultural lines.

India—because of its complexity, its long historic continuity, the coexistence of different levels of civilization, creeds, and races, its proved capacity to absorb foreign and novel cultures—presents one of the most challenging and rich cases of cultural integration to be found anywhere. Its study in the present period of transition should prove useful not only to the development of the social sciences, but to that process of self-discovery of which Professor GADGIL spoke: for Americans, too, are in search of a self.

Tracing some broad trends in Indian studies in the United States, Professor BROWN contrasted the early period when Indic studies were pursued by a small band of great scholars like WHITNEY, BLOOMFIELD, HOPKINS, LANMAN, and JACKSON, and their pupils, with the rapidly growing number of workers in the field since the Second World War. The work of the early period maintained the best standards of scientific scholarship in humanistic studies, that is, in linguistics, history, literature, religion. But scarcely any research was done at this time in the United States in the social sciences as they apply to India. The present trend continues humanistic studies, but puts its chief emphasis in economic, sociological, and anthropological studies, and modern languages. It is a practical response to the situation prevailing in the United States during and after the recent war, when a number of governmental and educational agencies realized that they did not have the knowledge necessary to view intelligently the new nations in South Asia with whom the United States must live as neighbours on equal terms.

This situation stimulated many universities to organize area studies programs for various parts of Asia and Africa with support from the private philanthropic foundations. Among these programs have been programs on India, South East Asia, and the Near East. More recently the Ford Foundation has entered India with action programs designed to contribute to the work of social reconstruction.

Professor BROWN said it was his personal view that departmental isolation with restriction to a single field of intellectual interest is no longer valid in the study of India in the United States. The need is to view the Indian field as a whole, and to encourage research in all aspects of Indian civilization

at all periods. In this widened conception of the field, the historical and cultural approach of the humanities is as necessary as the descriptive and analytic approach of the social sciences. He illustrated this thesis by reference to studies of nationalism, caste, political alignments, and religion.

Mr. Chadbourne GILPATRIC said that there exists a most important need to plan Indian and intercultural studies generally, particularly in the United States, where the trend to overspecialization is still running strong, where there is a serious cultural problem in conserving what has been learned and in learning what needs to be learned, and where the role of government has been changing from indifference and neglect to a somewhat uncritical overattention. With respect to the present seminar, Mr. GILPATRIC regretted that more philosophers, historians, writers and artists were not present—for all these, he thinks, have an important part to play in intercultural communication. Such communication needs to be mutilateral and not merely bilateral.

Professor S. K. CHATTERJEE said he agreed with Professor GADGIL's diagnosis of a loss of nerve among young Indians. He finds them ashamed to talk about religion—they would rather talk about "culture"—and far more interested in leading a comfortable life than in leading a good life. The perennial values of faith in God, in man, in freedom, in social justice, and in one's own people—recently reaffirmed in the Constitution of Indonesia—are losing their hold on the younger generation, and he hoped that discussions like the present one would stimulate an interest in these ultimate problems. He had to confess that he himself was an agnostic in his mind but emotionally a mystic.

There is, he thought, a basic difference between the Western or Greek approach to these problems and the Indian approach. In Greek thought, social ideals related men directly to one another, whereas in Indian thought they are related indirectly through their participation in the absolute Brahman. However, he did not think it correct to say that Western thought was predominantly materialistic; there is a spiritual side to it as well. He was particularly impressed with this dual emphasis on his recent visit to New York, where Rockefeller Center symbolized for him man's power over nature, and the students at Columbia University who wanted to hear about the Upanishads symbolized the moral interest.

Professor D. G. KARVE said that cooperative studies were quite new in India and held out promise of useful results for scientific research and for mutual benefit. When Oscar LEWIS did his study of group dynamics for the Planning Commission, he had no Indian counterpart. The strong point of such collaboration is that it makes it possible to combine the developed

social science techniques which the outsider brings with the intimate understanding of the culture and life of the people which the Indian collaborator brings.

There are, however, problems in such collaboration, and if it is to be successful it should be mainly at the top level, and not at the level of immature and unproved people; it should not sacrifice veracity to speed, and it should rely more on participation than on interview techniques. Most important of all, it is necessary for Indians to study their economic and political problems as they see them in the Indian context. Indian political and economic thought must grow out of Indian experience, and it is this which calls for courage.

Professor D. N. MAJUMDAR described the Lucknow-Cornell Research Center. He said it grew out of previous collaboration in the Senapur study, and the plan was worked out at Cornell by Professor M. E. OPLER and himself. The idea behind the project was that the Americans would provide the research tools and the Indians knowledge of the social background. The focus of the study was to be on cultural change, with one village to be in the community development area and a control village outside. Students working on the project would receive field research training. Professor MAJUMDAR said that the success of such collaboration depends on genuine cooperation, and on competent supervisors who are willing to spend much time in the field. He said that he was still optimistic about the results of the project and hoped that it would continue.

Mr. Wade JONES said that the interest of the Ford Foundation in the Lucknow-Cornell project represented one side of the Foundation's program —the research and training side. The Foundation was also interested in helping with problems selected by the Indian government. He did not think these two interests need conflict.

Mr. GUMPERZ testified that he had learned much from his Indian colleagues on the project and expected to learn more.

Mrs. KARVE said that in her opinion American students who come to do research in India suffer from excessive restrictions on their travel and duration of stay. She feels that a stay of at least eighteen months is necessary to acquire orientation, language skill, and a workable problem. She also hoped that there would be an opportunity during the Seminar to return to the problem of equality raised by Professor GADGIL; for her, equality consisted in equality of the cultural alternatives which are to be found in India, rather than in the formulation of a common legal code, as some now interpret it.

What do Village Studies tell us about Indian Culture and Society?

Professor DANDEKAR, who in the absence of Professor SRINIVAS introduced the discussion on this topic, said that since he would not talk about past village studies or review current ones, he would prefer to change the verb in the title from "do" to "can". The problem he would discuss is how much *can* the isolated study of villages tell us about Indian culture. Referring to his own training and background, he said that he was a statistician and had been working chiefly on economic problems in the Agricultural economics section of the Gokhale Institute. His recent studies of a group of villages go beyond the economic problems, because he was interested in the directions of change, over a five-year period, and for this purpose, changes in economic magnitudes like agricultural income might not be great enough to register important shifts. He tried therefore to find other indices of change.

Before discussing these, Professor DANDEKAR made some comments on the methodology of village studies. There were two different types of village survey, one personal and the other impersonal. The personal type proceeded with no explicit plan of investigation and its results depended on the equipment and prejudices of the individual investigator. The impersonal type, on the other hand, worked from a predetermined plan and used strictly impersonal methods of study even when dealing with cultural phenomena like ceremonies. He did not, parenthetically, understand the fascination which such things as ceremonies, folk tales, folk songs, have for sociologists and anthropologists; they were not important concerns of ordinary people in their daily lives. Participation as a method of getting information is legitimate if it means getting the confidence of the subject but if it means action and taking sides it is not reliable. Sometimes it is necessary to initiate action to set a static society into motion, but if the investigator participates in this he should do so with an attitude of strict neutrality towards the results. Trained social scientists with teams of trained assistants are needed to do village studies, and the study should be of several villages to get a sense of the large variety.

With respect to the study of actual changes he has concentrated on prime movers like population pressure, and on types of changes which provide good indices to the direction of change: e.g. intercaste marriages revealing the breaking down of caste barriers, occupational mobility over several generations, migration to urban areas, position of women, incentives of different classes, etc. On all these matters, he has found it possible to draft reasonable questionaires to which reliable answers can be given.

Professor KOTHURKAR asked whether an informal conversation with a person could not reveal more about his outlook than a formal questionaire.

Professor DANDEKAR agreed that some information could be obtained in this manner but it is an artistic method.

Professor MAJUMDAR offered some extended comments on Professor DANDEKAR's presentation. In these remarks he emphasized the usefulness of doing village studies in several different regions in order to include the variations in regional patterns. He also defended the method of participant observation as essential in establishing rapport. He did not think anthropologists worked without a plan but he believed that the plan must be subject to change. In earlier days it was true that data were primarily qualitative, but now more quantitative data are used. He differed too with Professor DANDEKAR's appraisal of the trend of cultural changes. The caste system, he thought, would remain for some years to come and there were very few cases of intercaste marriages. This opinion was supported by Professor DAMLE, who said that in a survey he conducted in Bombay it was very difficult to find a thousand cases of intercaste marriages to study. Professor MAJUMDAR further recommended that cultural change be studied through a preliminary accumulation of base-line data which could be used to interpret changing trend. In all these problems, he felt that cooperation between economists, statisticians and anthropologists should be sought.

Mr. JONES said that the value of village studies depends on what we want them to tell us. Many of the recent villages reported in the *Economic Weekly* series were purely descriptive in type and were not, in his opinion, likely to answer the questions raised by problem-orientated research, for example, the structure of village leadership.

Professor DAMLE regretted the use of so many distinctions between qualitative and quantitative, personal and impersonal, etc. Villages could not be studied in isolation, but could be studied comparatively with the help of scaleogram techniques. He defended the anthropologists' interest in ceremonies and rituals. These things, he said, were not studied for their own sake but for their inter-relations and functions within the total context of a society.

Mr. GILPATRIC observed that much of the discussion reflected an authoritarian "master-mind" approach. He wanted to know who are the "we" who are the beneficiaries of all this research. As a humanist, he would like to charge the social scientists with talking to one another instead of trying to develop a widely shared intelligence.

Mr. EVANS asked Mr. DANDEKAR if his interest in the study of cultural change was a primary interest or whether it was merely a by-product of his interest in economic changes. Mr. DANDEKAR replied that it was a primary

interest. In that case, Mr. EVANS said, the framing of the questions used in the questionaires should be done on an interdisciplinary basis. Mr. SINGER supported this position by citing the experience of recent social research in Israel, in which an expert on scale theory consulted anthropologists to guide the framing of questions.

Dr. I. KARVE did not see why it was necessary to go from economic to social and cultural changes. A cultural anthropologist would begin with the cultural changes themselves.

Professor RAGHAVAN said that since a great part of Indian culture had been built up in villages and much of it still survived there, village studies could throw a great deal of light on Indian culture.

Replying to the many comments on his paper, Professor DANDEKAR said that he had turned to cultural indices of change because these are more stable than other indices. He had doubts about using a study of a single village as a basis for generalization for statistical reasons, nor did he think it an easy matter to define the limits of village membership. Participation, he repeated, might be helpful if it were disinterested and were not active participation.

Answering Mr. GILPATRIC'S question as to who are the "we" who will benefit from the research, he said that the villagers are the "we", and that they are not interested in folk songs; they already knew these.

Present Status and Needs of Social Science Studies in India.

Professor D. N. MAJUMDAR read a paper under the above title. He confined his remarks to three topics: (1) the relation of the social sciences to public policy and administration, (2) an inventory of research and the need for coordination, and (3) some practical suggestions regarding the development of the social sciences and of anthropology in particular.

Recent years, with their grim lessons of war and postwar reconstruction, have brought increasing awareness of the social responsibility of scientists. The social scientist too cannot afford to neglect this problem. His responsibility does not end when he has supplied the facts; he must be associated with policy making and administration. "Human social life has the quality of integration of structure; it is like a web, which tends to get repaired when it is torn. This is a healthy quality but also a dangerous one. The mistakes which are committed today will not be easily eradicated tomorrow. The policy maker and the administrator can ill-afford to go about their jobs without understanding the consequences of what they do. It is the

social scientist alone who has the competence to understand and interpret social life, its problems and potentialities."

Reviewing the development of anthropological research in India, Professor MAJUMDAR finds that although anthropological work in the few universities which teach anthropology has covered all the fields of anthropology, this work has been too exclusively descriptive, restricted to one or two areas, and deficient in cooperative planning. He recommended an Anthropological Association which would give anthropologists an opportunity to meet, examine existing research, and plan for future research. Such an association, which he compared to the social science research councils in other countries, would be able to advise both universities and the government,

Among the practical tasks to be done to develop the social sciences, and anthropology in particular, Professor MAJUMDĀR mentioned a revision of the Castes and Tribes Series to give social scientists the necessary enthnographic background for their research; city surveys which focus on a total approach to civic life rather than on a statistical enumeration of economic magnitudes; village studies with special stress on contemporary transformation process and present problems; tribal studies examining the cause and course of cultural crises facing these communities and proposing plans for their rehabilitation; area studies, which in India for financial reasons would have to concentrate mainly on internal studies rather than on foreign areas; and studies of technological change and its social consequences. All these tasks require trained social scientists, and a programme for increasing and improving training facilities should be undertaken by the Universities with financial support from the government.

In the discussion of Professor MUJUMDAR'S paper, a question was raised whether he had not identified the social sciences too exclusively with anthropology. He replied that he had not identified them, but that he wanted to speak on the general problem with special reference to anthropology, since there was a special need to develop anthropological studies in India.

Professor ALTEKAR pointed out that Indian archaeologists had an association in the field of archaeology similar to the one proposed for anthropologists.

Part II: *Variety and Integration of Indian Culture.*

Three sessions of the seminar were devoted to a discussion of the problems of cultural integration in India.

Incorporation of Folk and Regional Elements into the Classic Pattern.

Dr. V. RAGHAVAN presented a paper on "Variety and Integration in the Pattern of Indian Culture," in which he sketched some of the ways in which the classic pattern of Indian culture developed through the incorporation of local and regional elements. "As this culture went about its course of consolidation over this vast country, it adopted certain characteristic methods which showed themselves uniformly wherever it went, not only in India and the regions on its fringe, but in all those trans-India territories too where it attained an expansion." Since Sanskrit was the ultimate medium of the main body of this culture and Sanskritization the chief technique of the take-over, Dr. RAGHAVAN showed that an examination of the main branches of Sanskrit literature revealed some of the regional and folk elements that had been incorporated into the main tradition of the culture. The Dharma Sastras themselves discuss the problem of varying local practices and custom, and reveal a spirit of realism and accommodation. The general attitude is that where they do not go against the basic principles enunciated in the Veda, they are to be recognized and allowed. Such local practices as the worship of the Mother Goddess, festivals like those of Indra's banner of the Spring (Holaka), and of the bull, and the worship of certain plants and trees—are approved and may even become universalized. Other local practices are disapproved, e.g., marriage with a maternal uncle's daughter, which is prevalent in the South. In many cases, the regional customs continue side by side with the Vedic rites, although they may have no sanction in the ancient texts. Examples are the offer of the cocoanut and the betel-leaf and betel-nut in religious services, and the Tilaka mark on the forehead of a lady.

The Dharma Sastra also evolved a scheme of fitting the numerous tribes and occupations into the social body by identifying them as offsprings of *anuloma* and *pratiloma* marriage relations and by a theory of improvement or deterioration of social caste-status (*Jātyutkarsha* and *Jātyapakarsha.*).

Rulers too had their ancestory traced in inscriptional eulogies to Gods and epic heroes, and whatever their vernacular names, they took high Sanskrit titles and surnames, and by the well-understood belief that one becomes a ruler by virtue of an element of the divine in him, the ruler was duly honoured and had Vedic sacrifices conducted for him. "Thus as each community or group of people in different localities became powerful, and gained greater or lesser power, locally or over a wide region, it was taken up and elevated."

In the field of religion and worship, popular religious cults and conceptions first gain ground among the people, then enter such popular books

as the Puranas, and finally are recognized by philosophers and authors of religious works. This process also occurs in the growth of holy places, which through the Puranic accounts of their greatness (Mahatmyas) are linked to epic heroes, gods, and episodes. Here too, elements of local color, legend, custom and practice are somtimes conserved and may enter into the main tradition. For example, at the Temple of Tyagaraja in Tiruvarur, Tanjore district, an untouchable family which originally had an intimate connection with the shrine still enjoys the right to lead the procession, and a legend is given which exalts the family leader as Indra himself born in that community owing to a wrong done against the deity.

The Tantric literature illustrates the process of assimilation of similar local deities and popular worships to a single cult of Sakti of which the different kinds of female deities and Mother Goddesses are different manifestations. The gographical range of this Tantric literature includes not only different parts of India but Tibet and China as well.

Within a single family of a higher caste, one may find all gradations of belief and practice from the lowest to the highest. In such cases the lower popular beliefs like worship of planets, small-pox deities, etc., are integrated and informed by higher Vedantic philosophy. It is possible to find some of these popular practices restricted to special family traditions and handed down from generation to generation alongside the Vedic rites.

Literature, drama, the dance, and music reveal many folk and regional influences. Examples include the Brihathaka storehouse of stories, the Uparupakas, the Gandali and the Perani dances, and the names of many ragas. In these cases folk forms are taken up, sophisticated by classical artists and connoiseurs, and made part of a regular traditioin to be universally adopted in other regions and taught from codified texts. The treatises on dance and music themselves distinguished classical and folk elements in the arts as Marga and Desi forms respectively, and describe how certain folk forms become Marga. Frequently the regional and folk origins are preserved in the technical names of styles and ragas of music.

Festivals, too, disclose features of local origin, absorption, and universalization. Holi, which is now fairly universal, was originally an eastern festival.

The preceeding examples make evident the following characteristics of Sanskritization as a process of formation of a great tradition.

1. It was not a destructive force, but a tolerant and comprehensive absorption and conservation of existing practices and customs.

2. It reduced a bewildering mass to some cultural homogeneity.

3. The synthesis resulted in a refinement — lower practices were totally put down, or given an esoteric significance and elevated to a higher philosophy.

The Common Indian Style of Speech.

Professor S. K. CHATTERJEE led the discussion on "Variety and Integration in the Pattern of Indian Languages." Linguistic development, he said, has been similar to cultural and racial development. A great mixture of races and cultures has resulted in tolerance and in the gradual evolution of a common pattern. There are about seventeen major languages in India, besides a number of minor ones, and these represent four distinct speech families — the Austric, the Sino-Tibetan, the Dravidian, and the Indo-European, which is probably the youngest.

The spread of the Aryans in North India not only involved an assimilation of the Indo-Aryan language by other groups but involved also a reciprocal influence from the non-Aryan languages which changed the character of the Aryan language in Phonetics, in Morphology, in Syntax and in Vocabulary. Sanskrit Vocabulary has been very remarkably enlarged with Dravidian words (see BURROW), just as there are Sanskrit and other Aryan words in the Dravidian languages.

The result of these mutual interactions and influences has been the creation of a *Common Indian Type of Speech* embracing Aryan, Dravidian, and Austric as well as Sino-Tibetan languages, just as there has developed a *Common Indian Type of Man* through racial miscegenation. Some of the characteristics of this Common Type are :

1. Pronunciation of cerebrals or retroflex sounds, which do not occur in Indo-European languages (although they have developed in recent times in Scandinavia).
2. Dropping of prepositions.
3. Use of post-positions, from Austric and Dravidian.
4. Loss of significant prefixes.
5. Dropping of the inflected forms of the comparative and superlative adjectives.
6. Change of a verbal structure in the sentence in favour of a nominal and adjectival structure as in Dravidian.
7. Extensive use of verb meaning 'to do' with a noun or adjective to form derivative verbs (denominatives).
8. Compound verb constructions, in which the first verb is modified by a second one acting like a modifying prefix or adverb.

9. Use of echo-words e.g., Hindi *ghoṛā-woṛa*—'horse etc.' (This is also to be found in Turkish and Persian).

In the evolution of this common pattern, some languages from the outside have also contributed, but their influences have been fully digested (Persian being one instance).

In the discussion which followed, Professor BROWN asked Professor CHATTERJEE to comment on language as a social force in India to-day. Professor CHATTERJEE replied that Indians have always been easy-going about language, although there was more consciousness about language to-day. The feeling that there should be a single national language really springs from a desire to save face with foreigners, and not from any deep seated urge or emotion about the problem. A desirable language policy would keep English open for everybody and would make Hindi compulsory in non-Hindi areas while another recognised language of the Union of India other than Hindi or Urdu or Sanskrit should similarly be made compulsory in Hindi areas.

Dr. RAGHAVAN thought that asking people who had already sacrificed their mother tongue for Hindi to learn still another language would be too great a burden. He also questioned BURROW's list of Dravidian words in Sanskrit as somewhat speculative and wondered about the Dravidian source of the cerebrals. He expressed the hope that more North Indians would come to the South for study.

Mrs. KARVE suggested that linguistics should be pursued with the help of cultural anthropology, that, e.g., the fact that Aryans were landlubbers and the Dravidians a maritime expanding civilization had influenced their respective linguistic development.

Role of the State : State Planning in Ancient India.

Since the state has always played an important role in cultural integration, one session of the seminar was devoted to a discussion of the Planned State in Ancient and Modern India. Dealing with ancient India, Professor A. S. ALTEKAR pointed out that the conception of the welfare state planning the entire social, commercial and industrial life so as to remove or minimise inequalities and to ensure even distribution of wealth is a modern one. We cannot naturally expect it in the present form in ancient India. It is easy to find considerable evidence of planning administrative developments, religious propaganda and military and political expansion; evidence of planning for realising social and economic welfare is to be seen only off and on. We should further note that legislation, which is the main instrument of modern planning was not possible in ancient India. Law was partly religious and

partly secular. If it was religious, it was laid down in the sacred scriptures; if it was secular, it was laid down by immemorial custom. The state was there only to enforce the traditional law and to harmonise the conflicting interests of the different classes; it was believed that this would be sufficient to secure the moral and material wellbeing of the society.

A more positive and constructive attitude began to be advocated in the course of time as political thought became more developed and was less firmly under the leading strings of religion. Not only the *Arthasastra* of Kautilya, which is a purely secular work, but even the *Mahabharata*, which is essentially moral in its outlook, began to advocate the necessity of a state giving considerable thought and attention to the realisation of economic and moral welfare. According to these two authorities—with whom some of their successors also agree—the state ought to exert itself (1) to help agriculture, (2) to develop the country's resources in mines, forests etc., (3) to undertake a number of schemes to increase the national wealth and income, (4) to encourage trade and industry, (5) to patronise learning and science, (6) to prevent epidemics, (7) to provide against famines and (8) to extend relief to the poor, the distressed and the physically handicapped.

Dr. ALTEKAR then adduced purely historical evidence from inscriptions to show how some of the states in ancient India used to take special steps to construct dams, tanks and canals to help agriculture, to maintain grain stores to counteract famines, to found and maintain colleges for the spread of light and learning, to maintain dispensaries and hospitals to relieve the sick and the distressed and to take effective steps to develop mines, forests, roads and *ghats*. In the case of trade and industry, the state usually left the initiative with the private agencies and the trade guilds. Usually it intervened to protect the consumers and workers by controlling prices and penalising frauds.

It is difficult to say to what extent the average state devoted itself to realise the above objects. Dr. ALTEKAR referred to the intresting case of king Kharavela of Orissa, (c. 150 B.C.) whose inscription shows that he devoted about 40 percent of his time to promoting the cultural and material welfare of his subjects and about 60 percent of his time in striving to effect military conquests.

It has further to be noted that religion offered considerable cooperation to the state in realising the goal of social and economical amelioration. The same was done by the village committee. The former enjoined the construction of wells, tanks, ghats, and the endowment of hospitals and colleges as a religious duty; the latter devoted considerable part of their resources to promoting the moral and material welfare of their villages. Local patriotism was often powerful enough to induce the villagers to offer their

labour free in order to construct the works of public utility necessary for their village. Philosophy and outlook on life have changed considerably and so planning in modern India cannot be a carbon copy of what it was in Ancient India. The latter would, however, show that considerable attention should be given to the development of small-scale cottage industries in modern times also. Big industries cannot bear all the burden that is being put on them.

As to the question whether Britain introduced the planning state in modern times, Dr. ALTEKAR pointed out that she was following a policy of *laissez faire*, suited to her interests, down to the beginning of the First World War. Naturally she could not and did not introduce the conception of the planned welfare state in her Indian empire. That went against her own economic and political interests.

State Planning in Modern India.

Professor D. G. KARVE who initiated the discussion on the planned state in modern India, agreed with Professor ALTEKAR that the making of law by legislative enactment is a modern phenomenon in India. He characterized the traditional Indian state as a "decentralized, functional state." It is decentralized in being non-totalitarian, and functional in the sense that all institutions of the society contribute, in their respective spheres, to its welfare. The power of physical coercion is concentrated in the special institution of the government. This principle of state organization remained the same until the time of the British. It was only after experiencing British rule that Indians began to think of a juristic state, centralized and sovereign, with common codes of law, etc., and subsequent thought and policy were influenced by the prevalence of the *individualistic* and *laissez-faire* school in England. Since the government in India was controlled by a foreign company and then by a foreign state, it was naturally reluctant to accept positive responsibilities for promoting economic welfare. And even after 1858, with increasing travel and mobility, such responsibility was disowned, although the replacement of customary controls by individual contract law encouraged exploitation.

Until the end of the nineteenth century, no important economic functions were undertaken by the state in India. But at the turn of the century, two things happened, namely, serious epidemics and disastrous famines, which began to set going currents of opposition to the purely *laissez faire* conception of the state.

The renaissance of the social sciences was part of this same movement, which gave rise to the growth of the Congress party and to many of

the early reforms in irrigation and agriculture. This latter developed in the direction of state welfare activities in the field of health, education, public works, and so on. By 1921, the state had taken on some distributive functions through taxation.

Between 1921 and 1944, two factors influenced the increase in state responsibilities.

(1) The increase in popular representation in certain governmental agencies of the provincial governments, especially in the fields of education, agriculture, and local government, resulted in a more direct approach to the needs of the people and to some of the first village development schemes. The central government itself was not always sympathetic with these trends, e.g., it did not encourage local industries, and it also retained control over finance, revenue, and irrigation.

(2) For strategic reasons during the First World War, the British began to encourage local industry. This led to peacetime industrial development. Later, in response to the most urgent needs of local industries, a policy of discriminating protection was accepted. This too helped industry in sugar, paper and steel by the beginning of the Second World War. During the Second World War, Mr. GRADY was sent by the United States to help speed up industrial development. But with the improvement in the war situation, his proposals were held in abeyance.

These various circumstances conspired to put planning on the Indian map, so that long before widespread demands for an industrial revolution were heard, there was a demand for a planned state which would initiate industrial development. If more scientific and modernized methods are applied to agriculture, as is being done in the community projects, the scope for planning will increase. It is impossible for the non-agricultural part of the population in rural areas to be satisfied with their simple and outmoded ways of production any longer. A full-scale technological revolution will soon be initiated in our rural areas. The National Plan will have to provide for this.

For the future, the problem remains one of how much of this effort should be left to private individual enterprise and how much to state planning. The prevailing policy is to leave small-scale industry and land-holding in private hands, and to increase state responsibility for large-scale industry and for the over-all direction of the nation's economy. This is not a rigid policy, for modern planning is new and still in the making. It has to adapt itself continuously to changing circumstances.

In answer to several questions about the relation of small-scale industry to planning, Professor KARVE said that many of the reorganized rural industries will be cooperative in their structure and that these will have to fit in with the over-all policy of industrial development adopted in the plan.

Professor MAJUMDAR asked whether there was not a conflict between service and wages as incentives, especially for teachers. Professor KARVE replied that a functional attitude towards work could be developed and that the idea of a "calling" has a legitimate appeal, provided a sense of adequacy and equality pervaded the whole society.

He thought it important not to leave the masses to the economic nexus alone and to demand equal sacrifice of all.

Professor SINGER said that among Western writers on India, two different interpretations were usually given for the break in continuity between the modern and ancient political arrangements in India. According to the first of these interpretations, Ancient India had no indigenous basis for modern political institutions, these have been imported from the West, especially England, and have been superimposed on a very different social system. According to the second interpretation, foreign rule decapitated or suppressed the indigenous state powers, and this period having ended, it should now be possible to revive and develop them. He asked which of these interpretations was supported by the accounts of Professor ALTEKAR and KARVE.

Professor KOGEKAR said that it was an impossible ideal to try to harmonize the present situation with the institutions of the past, and that such efforts are a source of confusion. Contemporary policies, he thought, must grow out of and be adapted to present experience.

Professor BROWN observed that while some of the present political institutions may differ from those of the past, some of the motives and principles of political organization persist, e.g., the attitude towards law, which holds there is a law above kings, priests, and the state, is as old as the conception of *vrita* in the Rig Veda.

Professor KOGEKAR replied that such attitudes and values are universal and can be found in every country because they are abstract and lack content.

Professor D. G. KARVE said there is no question of reviving the past, that reformist opinion will prevail, and that a decentralized state, administered through appropriate functional groups and authorities, is closer to the genius of the people and that it would have to be guided in its development by current needs.

Urban Integration; Caste, Regionalism, and Nationalism.

Professor GADGIL opened the discussion on the trends of social integration especially as these are revealed by recent urban studies. Drawing upon his own studies of Poona, Kolhapur, and Sholapur, he distinguished three historical phases in the process of integration in Indian cities:

(1) The pre-Britiish period in Poona city is a period of great mobility, with the urban population recruited from different areas and groups and fairly quickly and completely integrated by becoming endogamous castes. Examples of such new formations were the market gardeners from U.P. who came to Poona and became a dominant element in the vegetable market, traders, Hindu and Muslim, from Gujerat, artisans and labourers from Taluqua, etc. During this period the caste panchayats, the guilds, and to some extent the government adjudicated conflicts.

(2) During the British period, the government abdicates much of its social authority, the caste panchayats are weakened, and the urban society becomes more rigidly stratified, with a greater drift between Hindu and non-Hindu groups.

(3) During the twentieth century, new elements do not integrate easily, professionals and officials who move from region to region become separated from the masses because they do not feel the need to learn any language but English, large amorphous caste associations develop to displace to some extent the caste panchayats, and there is a growing national influence on local practices.

At the present time, Professor GADGIL does not regard regionalism as a very important problem. It has increased as caste has weakened, but this is primarily due to a fear of state policies undermining the position of regional languages. If appropriate steps are taken to set these fears at rest, regionalism will disappear as a major issue. Caste on the other hand remains an important problem, especially as the caste system can no longer perform an integrative function. In the past an enormous number of different cultural groups were welded together by the caste system and a certain general unity with a live-and-let-live philosophy resulted. In this period the social-economic gradations roughly corresponded to the gradations of caste. But now that we want equality and have decided to get rid of the caste system we face the problem of preserving a live-and-let-live philosophy and avoiding a cultural uniformity in which all groups are reduced to a single set of values and practices.

Continuing the discussion, Professor I. KARVE said that caste was merely a symbol of the cultural process of differentiation and that polytheism, dress and food habits were other aspects of it.

There are important regional differences in marriage practices, settlement patterns, languages, and these should be recognized and studied. The cultural reality of India is a regional reality and not an all-India reality. In its cultural policies relating to language, marriage code, etc., the government should recognize the equality of different cultural alternatives as between different regions and not try to impose a uniform cultural code on the country as a whole.

Professor S. K. CHATTERJEE asked Professor KARVE whether despite these differences, there was not also a common Indianness? She replied that through the process of cultural communication, some things—like the epic of the *Mahabharata*—became national, but in studying Indian culture it is necessary to begin with a region.

Professor CHATTERJEE said that Indian culture is "a lotus of many petals."

Professor GADGIL said that there were some things like caste, hospitality, etc., which were common all over India.

Professor ALTEKAR cited some factors to explain the process of integration in the pre-British period: there was more rapid intercommunication, no grievance was felt towards newcomers because there was not much competition for place, the Brahmins were literate and in government service. He also observed that there were some intercaste marriages in ancient times but that eventually the cultural differences between Brahmins and non-Brahmins became greater, the Brahmins becoming more ritualistic and ceremonial, and the non-Brahmins less so.

Professor RAGHAVAN said that the cleavage between Brahmins and non-Brahmins has been exaggerated — that through their activities on behalf of popular education and through the Bhakti movement, the Brahmins had been in close touch with the masses.

Professor ALTEKAR replied that the Bhakti movement did not have much influence on social intercourse, that it did not permit equality in the field of marriage or affect the laws of inheritance.

Summarizing the discussions on cultural integration, Professor SINGER said that the different positions complemented one another neatly. The disagreements, he thought, were not over the existence of a culturally integrating process and a common pattern, but rather over its exact character and time-span, and the correct methodology for studying it. Professors RAGHAVAN and CHATTERJEE, taking a longrun view of Indian civilization as a whole, tend to stress the formation of a common cultural pattern out of the variety of folk, regional, and foreign ingredients. Professor I. KARVE, sensitive to the existing cultural diversities and to those governmental policies which over-

ride them, wants to start with a region as the primary unit of cultural reality and to stress the cultural differences between the different regions, as well as the process of cultural communication which links one to another. Professor GADGIL, on the other hand, has tried to tell the story of cultural integration, disintegration, and reintegration as it can be read from the last two hundred years of social history in cities like Poona. He finds that as the traditional integrating functions of the caste system have weakened, there has been a growing cultural consciousness of region and an increasing influence of national institutions and democratic ideals. Achieving a desirable balance between cultural variety and cultural uniformity is as yet, in his view, an unsolved problem.

Looking at the process from the standpoint of the role of the state, Professors ALTEKAR and D. G. KARVE have both stressed those factors — new social problems, increasing rate of social change, the influence of foreign rule, ideologies, and institutions — which have tended to increase the powers and responsibilities of the central government for all spheres of life. This trend has put the central government in a position to plan for a welfare state, but both Professor ALTEKAR and Professor KARVE suggest that such planning will conform to the genius of the Indian people and its traditions if it is decentralized and operates through the many existing non-government institutions.

Professor SINGER said he was struck by the similarities between the problem of cultural integration in India and in the United States. Allowing for differences in background, history and other circumstances, he thought that the diagnosis and prognosis which had been presented for India might well be applied to the United States.

Professor DAMLE said that in one respect there was an important difference between the American case and the Indian one. The heterogeneity of American culture was externally derived from the varied immigration, but in India it was internal and indigenous.

Dr. JONES asked whether there was any interest in and study of American culture in India.

Professor GADGIL replied that it was practically non-existent but that he would like to suggest the comparison of the American and Indian cases as a topic for the next seminar.

Dr. KATRE thanked the participants in the seminar on behalf of the Deccan College.

Professor BROWN thanked the Deccan College for providing excellent arrangements for the seminar.

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factors in the Lopars' changes of economic condition, but that the forests as the only supply of fuel necessitate the change of winter habitations.

Hunting seems to determine the boundaries of hunting territories, thus restricting the range of migrations. Fishing tends more than anything else to promote a sedentary life, the very location of lakes and rivers making necessary a stay in one place during the fishing. Various periods of spawning, assuring concentration of fish, influence the nomads to adopt more or less permanent habitations and originate clan ownership of those places. Hunting the wild reindeer, which migrate in definite directions, led the Lopar hunter southward into the forests, while the inclination of the domesticated reindeer for south-north movements brought him back to the seashore. Mr. Charnolusky concludes that

> the economic importance of combining reindeer breeding with the fishing, and the very essential dependence on reindeer as the sole means of reaching distant hunting and fishing territories, form the axis on which revolves the life of the nomadic Lopar.

EUGENE GOLOMSHTOK

The Mysore Tribes and Castes. Vol. IV. The Late H. V. NANJUDAYYA and RAO BAHADUR L. K. ANANTHAKRISHNA IYER. (viii, 677 pp. 20s. Mysore: Mysore University; Mysore Government Press, Bangalore, 1931.)

This new volume on Mysore ethnography from the pen of Mr. Iyer will undoubtedly be a valuable addition to the knowledge of Southern India. The author is known in the United States not only from his work on Cochin ethnography but also from his work on Syrian Christians which was recently reviewed in these pages (AA, n.s., 32, 1930, p. 318 *sq*.)

The plan adopted for the presentation of the material is an admirable one for reference purposes. Tribes and castes are arranged alphabetically, and the marginal notes indicate special characteristics of each particular tribe. The subsections deal principally with notes on the origin of the tribes or of the castes, their internal structure, marriage customs and ceremonies, puberty customs, laws of inheritance, tribal organization, religion, death ceremonies, feasts and festivals, and dress and adornment. But very little has been said about their physical characteristics. The present volume begins with "Kotte Okkalu" and goes as far as "Vodda."

Mysore as a province is especially interesting to anthropologists because of its geographical position. It is in this part of India that one would expect to find Dravidian culture in a more or less pure form. From a perusal of the book it seems that the culture of all the tribes dealt with is essentially Hindu, although Dravidian traits are interspersed throughout. Taking the death ceremonies for example, we find that no fewer than twenty-eight tribes, professing the Hindu religion, bury their dead. The funeral ceremonies of these twenty-eight tribes are, however, Hindu; in most cases the period of ceremonial pollution is ten days, after which, on the eleventh day, they bathe and put on new clothes.

The marriage customs of nearly all the tribes in the present volume are the same as among the Hindus, with slight variations here and there. Traces of certain ancient

forms are still to be met with in Mysore; thus, among the Kuruba, promiscuity is tolerated, and, in fact, it seems to be well recognized under certain conditions (p. 48 *sq.*). Many other interesting facts are also brought out.

From the very nature of the work it is necessarily sketchy, but this does not decrease its value in any way. The book, as I take it, is intended primarily for government officials going to India with little or no knowledge of the people; and for them it should prove invaluable. On the other hand, if Mr. Iyer himself or some one familiar with Southern India were to study each particular tribe it would be a real service to anthropology.

Finally, it seems to me, that the illustrations are chosen more for "effect" than for any other purpose.

BIREN BONNERJEA

SIND'S PREHISTORIC CIVILISATION

By Sir John Marshall.

In this article the Director-General of Archæology in India describes the wonderful discoveries which are being made in Sind, where relics have been found of a civilisation which dates back many centuries before Christ. Unique photographs of some of the discoveries are reproduced in our art supplement.

CONSIDERABLE public interest has been taken of late in the archæological excavations which are being carried out at Mohenjo-Daro in Sind—they have given ample evidence that the exploration of a most important phase of Indian civilisation, which shows close affinities with the contemporary Sumerian civilisation of Mesopotamia, is now being pushed forward in earnest. But it is not so generally known that not only has the writer been for the past three months at Mohenjo-Daro with a body of about 900 workmen and an adequate staff of officers and technical assistants, but explorations have been carried still farther afield.

A seal which was found at Harappa.

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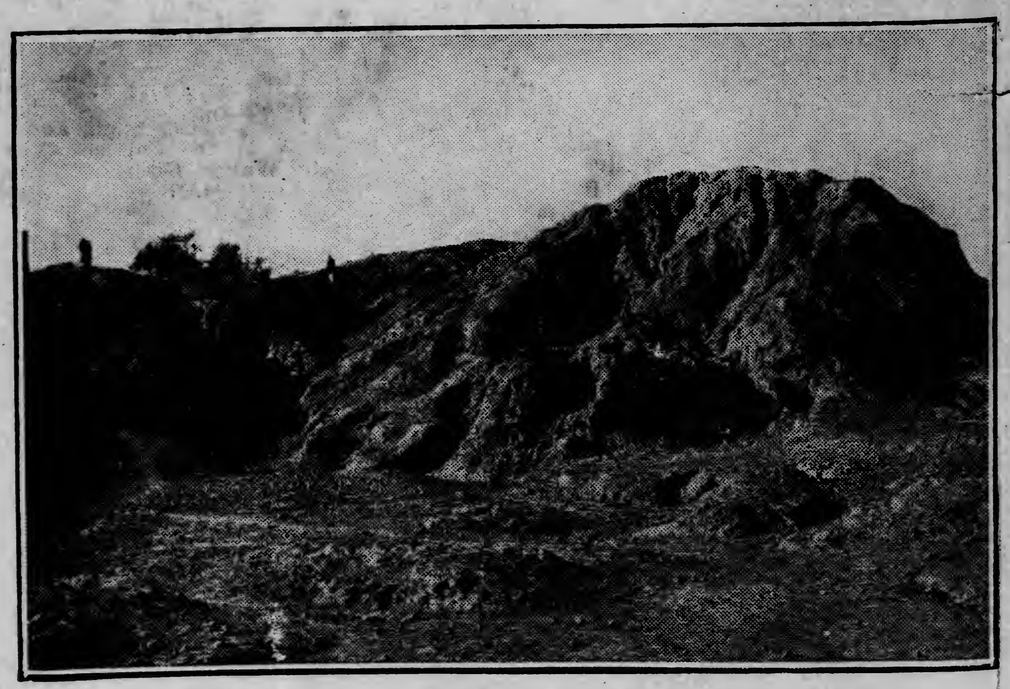

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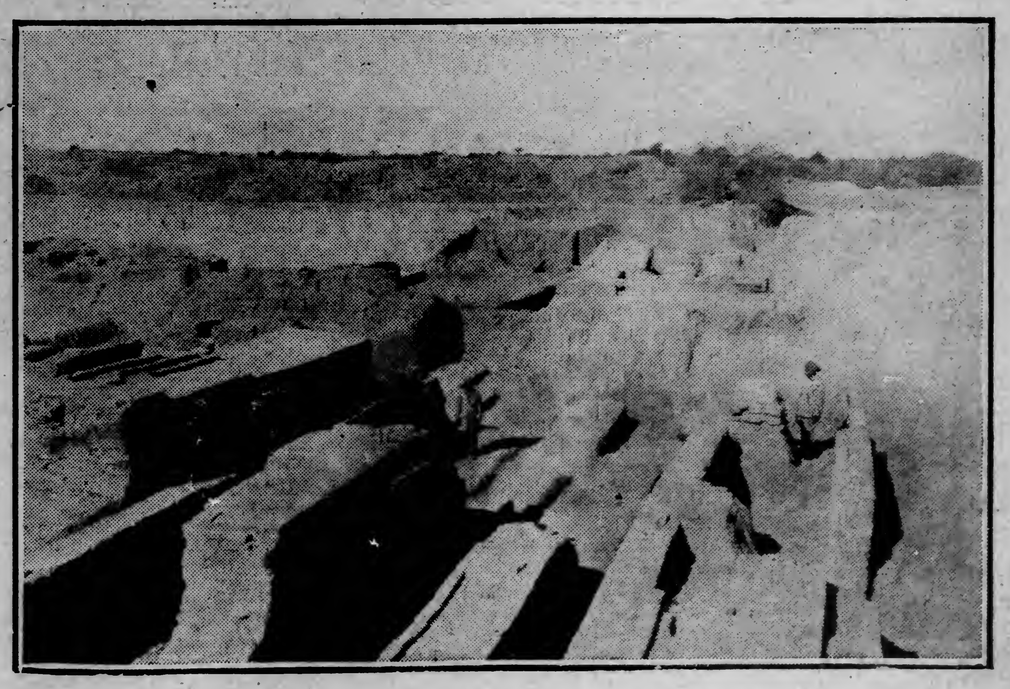

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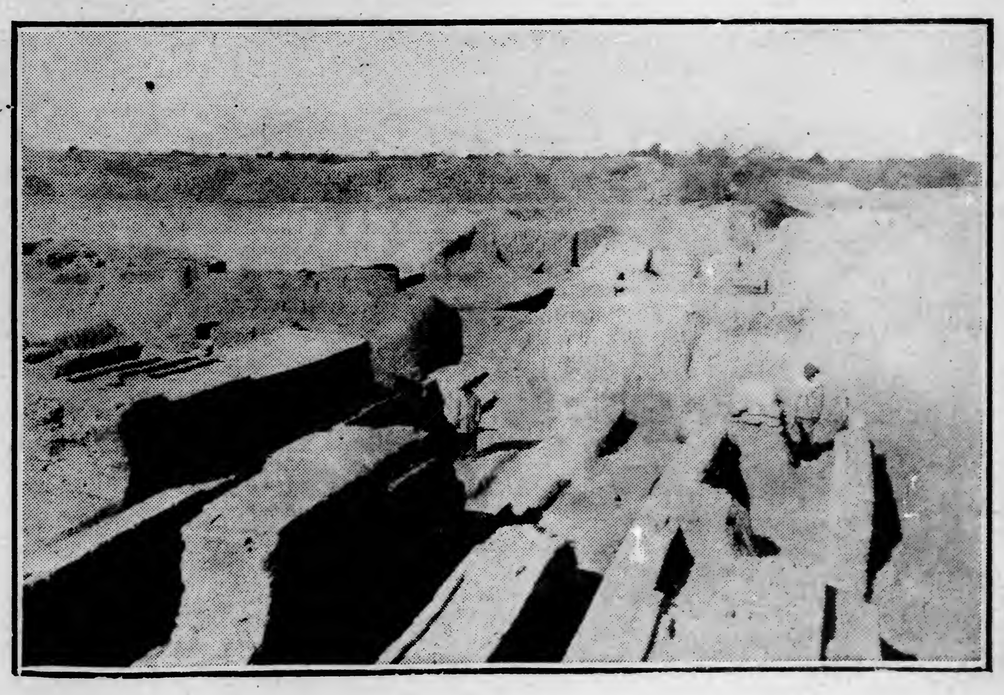

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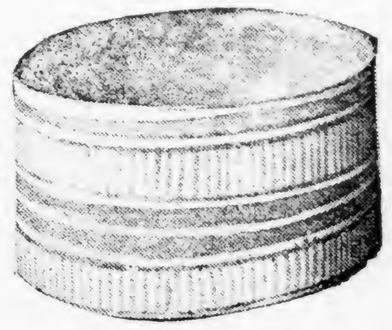

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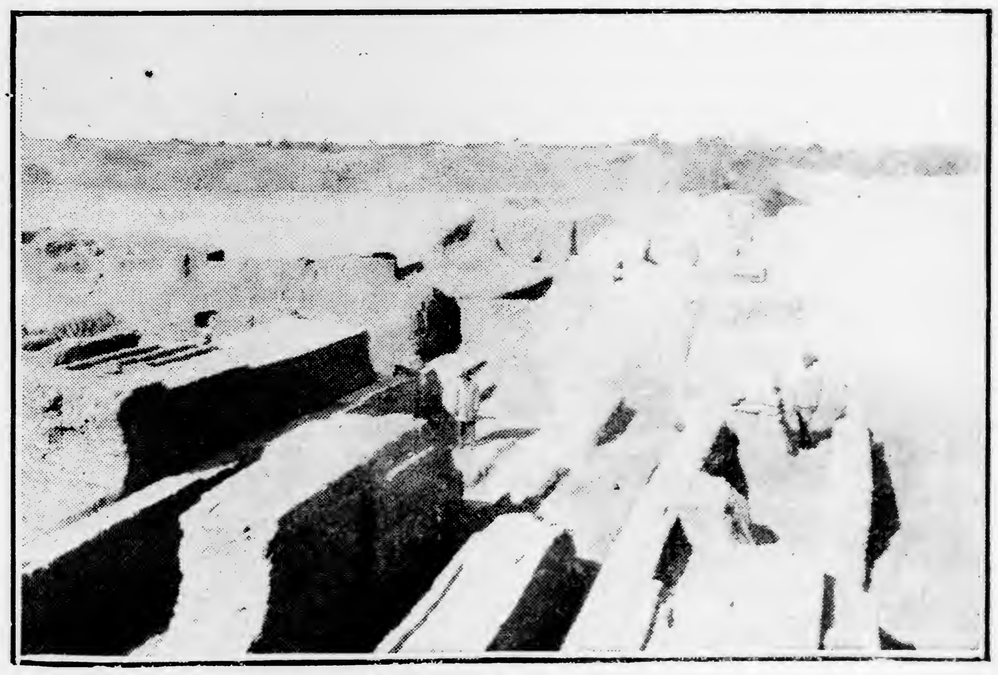
That this great civilisation which is now being revealed was no mere provincial off-shoot of Mesopotamian culture, but was developed for countless generations on the banks of the Indus itself and its tributaries, is becoming more and more manifest as the excavations advance. Who the people were who evolved it is still an open question, but the most reasonable view seem to be that they were the pre-Aryan (probably Dravidian) people of India known in the Vedas as the Dasyus or Asuras, whose culture was largely destroyed in the second or third millennium B.C. by the invading Aryans from the north, just as the older Aegean culture of the Mediterranean (which in some respects bears a striking resemblance to this culture of the Indus) was largely overwhelmed by the invading Achaeans. Whatever their racial origin, they seem, from such evidence as is available, to have borne as little resemblance to the modern Sindhi as the Sumerian did to the present inhabitants of Southern Mesopotamia. Thus, two statues of bearded men which have just been exhumed at Mohenjo-Daro, portray a very distinctive brachycephalic type, with strikingly low forehead, prominent nose, fleshy lips, and narrow oblique eyes,—and this is the type also which is seemingly portrayed in some of the rough terracotta figurines found at Mohenjo-Daro and Harappa. The material, however, is as yet too scanty for inferences to be drawn from it on this interesting question. One of the statues referred to, it may be mentioned, is of alabaster; the other is of limestone with a veneer of fine paste, the patterning on the robe being coloured in red ochre and the eyes inlaid with shells.

A corner of the mounds at Harappa in the Punjab, before the excavations had been made.



The largest building which has been unearthed at Harappa. Its purpose is unknown.

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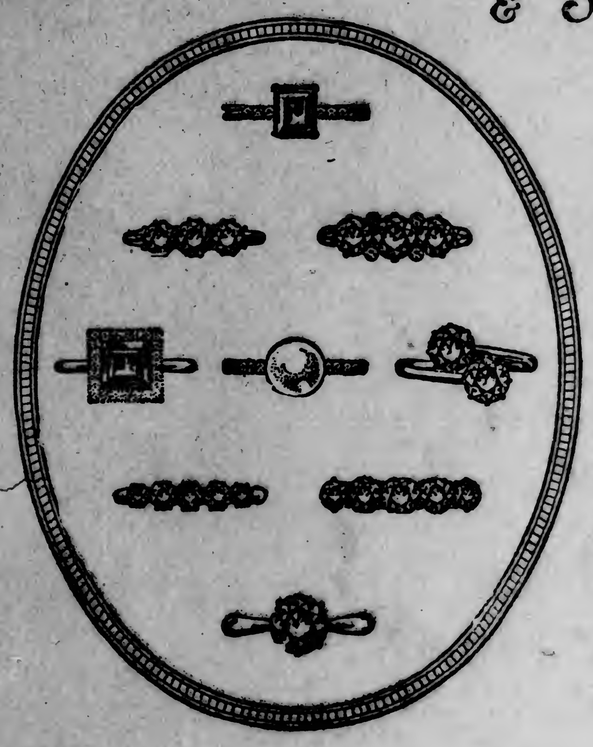

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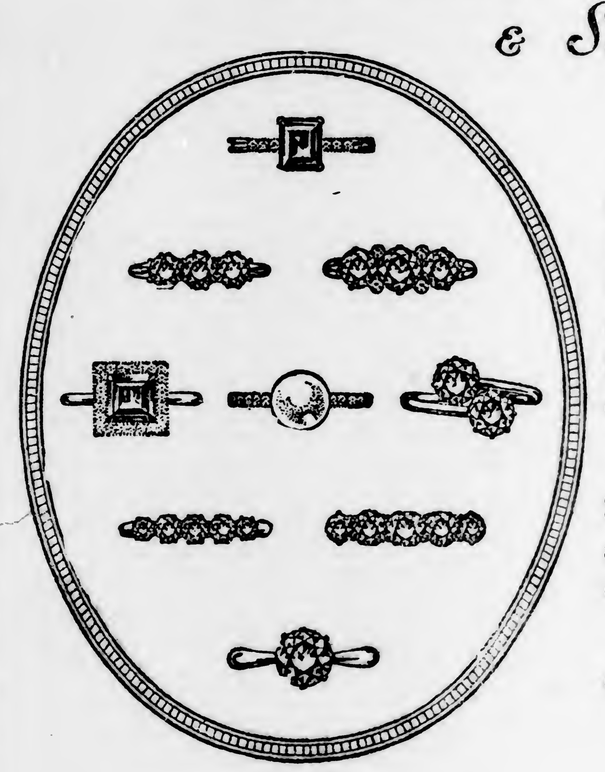

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Japan

C. Hart Merriam
Papers
BANC MSS
80/18 c

has been appointed to the chair of chemistry in the University of Aberdeen in succession to Professor Frederick Soddy.

Sir J. J. Thomson, master of Trinity College, Cambridge, who recently resigned the Cavendish professorship of experimental physics, has been elected into the newly established professorship of physics. This professorship is without stipend, and will terminate with the tenure of office of the first professor unless the university determines otherwise.

DISCUSSION AND CORRESPONDENCE

FIRE-WALKING IN JAPAN

During my four years' residence in Japan I had several opportunities of witnessing the spectacular religious or quasi-religious ceremony periodically observed at the Ontake Temple, Tokyo, in the course of which the officiating priests walk barefoot over a bed of live charcoal, throw boiling water over themselves and climb a ladder of sharp swords set edge upward. All these pretended miracles, however, are susceptible of scientific explanation, and it is only with regard to the first-mentioned—the fire-walking—that I venture to ask the privilege of making a brief statement in Science.

To the great mass of the spectators in the temple enclosure, who do not usually include more than the merest sprinkling of the more intelligent and better educated classes of the Japanese people, the supposed miracles are the clearest demonstration of the supernatural power of the priests, who would have it believed that it is solely to their incantations that they owe their protection from injury. But it is not necessary to be a very close observer of their movements to perceive that the priests are not content with their perambulations, genuflexions and prayers, but are careful to rub their bare feet with salt, *ostensibly for purificatory purposes,* before walking over the fire. This fact brought to my recollection the occasion, forty years ago or more, when Tyndall astonished a distinguished audience at the Royal Institution by plunging his bare arm into molten metal, the then Prince of Wales, afterward King Edward VII., who was present, being prevented from following Tyndall's example only by the determined opposition of his wife.

So sure did I feel of the efficacy of the salt as a protective agent that on my second visit to the temple I determined to follow the priests in their apparently hazardous adventure, and so after rubbing my feet well in the pile of salt, I walked rapidly over the bed of glowing coal, some eighteen feet long. My confidence was not misplaced. In my feet I felt only a sensation of gentle warmth, but my ankles, to which no salt was applied, were scorched.

After a careful examination of such of Tyndall's works as I had access to at the Yokohama Club, without finding any reference to the demonstration at the Royal Institution, I wrote to Sir William Crookes, who not long before had mentioned to me his association with Tyndall in some of the experiments that preceded the delivery of the latter's famous "Lectures on Light." In due course I received Sir William's reply, in which after reference to certain matters of no special interest in this connection, he said:

> I do not know of any published account of Tyndall's putting his bare arm into molten metal, but I can well believe it, as I myself have plunged my hand into molten, almost red-hot, lead. I was in a profuse perspiration at the time, and, immediately before, I dipped my hand into strong ammonia, to increase the spheroidal effect. I do not think the extra precaution was of much use, but I did not like to take a risk when looking at the cauldron of hot metal.

To physicists there is nothing new in all this, but not every scientific man is a physicist, or hypnotism would not have been suggested to me, as it has been, as the secret of the remarkable immunity I experienced.

John Hyde

Washington, D. C.

MARCHING IN STEP

To the Editor of Science: In regard to Walter Moore Coleman's note in the April 18 number of Science concerning variations in phase in the step of a column of soldiers it

Nat. Geog. Mag. July 1921.

AN AINU SAINT NICHOLAS OF SHIRAOI, HOKKAIDO, JAPAN

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Retake of Preceding Frame

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TWO SMALL CANDLES FOR A 70TH BIRTHDAY.
George Ade, humorist, cuts the cake presented to him on his anniversary at his Winter home at Miami Beach, Fla.
(Times Wide World Photos.)

A ROPE WITH EIGHT KNOTS SYMBOLIZES AN ANCIENT LEGEND OF JAPAN.
The Tsuna-Hiki festival is celebrated in Osaka with the cutting of all eight knots of a huge coil of straw by a girl who re-enacted the slaying of a great snake with eight heads by one of the legendary heroes of Japan.
(Times Wide World Photos.)

TWO SMALL CANDLES FOR A 70TH BIRTHDAY.
George Ade, humorist, cuts the cake presented to him on his anniversary at his Winter home at Miami Beach, Fla.
(Times Wide World Photos.)

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(Times Wide World Photos.)

Miss Martha Beckwith
Bishop Museum,
Honolulu

Honoring the visiting professors and summer school students at the University of Hawaii the Honolulu Academy of Arts is presenting

MR. ROYO YOSHIDA

who will give an exhibition of the dance called "Shimai" in the Educational Courtyard of the Academy on Friday, July 17, at 8 p.m.

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The "Shimai" dance is one of the oldest of Japanese dances. It was danced before the Samurai and the nobles about seven hundred years ago, and the movements are not changed from the original manner. It is not danced in costume, but is closely connected with the No dance, and was one appreciated by the most cultured Japanese in times past. It might be called the father of all later dances in Japan.

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In the afternoon and evening of July 17th there will be on view at the Academy Japanese flower arrangements from four different schools. Mr. Oda from Hongwangi Temple at Aiea will represent the Ikenobu School; Mrs. Hoshi-ho Tatsuguchi will arrange flowers in the Misho Rui; Miss Shizuko Miyahata will represent the Enshiu School, and pupils of Mrs. Sanford S. Katsuki will have arrangements in the So-getsu Riu.

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<u>You are cordially invited to attend</u>